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Understanding Access to Health Information: The Role and Measurement of Social Location

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UNDERSTANDING ACCESS TO HEALTH INFORMATION: THE ROLE AND MEASUREMENT OF SOCIAL LOCATION

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by

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A DISSERTATION

Presented to the Faculty of
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UNDERSTANDING ACCESS TO HEALTH INFORMATION:
THE ROLE AND MEASUREMENT OF SOCIAL LOCATION

Megan S. Kelley, PhD, MS, CHES

University of Nebraska, 2015

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Abstract

The purpose of this research is to explore how application of social location theory may improve data collection on health information access in order to better inform and improve the effectiveness of health communication and messaging. This dissertation proposes a framework to understand how people obtain health information based on the idea of social location, Ritzer and Bell's (1981) levels of social reality, and Dahlberg & Krug's (2002) social ecological model. This research addressed the extent to which three studies of health information access support the use of such a framework, and if so, how its application could improve our understanding of access to health information, and correspondingly, our methods of health communication.

The first study examined the Douglas County Community Health Survey, a population-based telephone survey of 1,503 respondents ages 18 and older living in Douglas County, Nebraska in 2013. This study assessed how elements of social location influence respondents' primary health information source and the number of health information sources used.

The second study drew on the 2011-2013 National Survey of Family Growth to examine sources of sex education (formal, parents, and doctor) and topics covered with each source (abstinence, STDs, and contraception) among a nationally-representative sample of 15-24 year-old male and female respondents.

The third study looked at data from an online survey of 757 LGBTQ adults in the state of Nebraska. Demographic characteristics, health care access, minority status, outness to health care provider, personal autonomy, and discrimination experience were compared among participants who did or did not report seeking health information online.

Finally, the results of the three studies were synthesized into a Social Location Framework. This framework provides a visual representation of how elements of social location relate to each other and collectively contribute to health information access, and provides for identification of potential gaps in the measurement of access to health information.

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List of Abbreviations

Abbreviation	Definition
CDC	Centers for Disease Control
HISB	Health Information-Seeking Behavior
HIV/AIDS	Human Immuno-Deficiency Virus/ Auto-Immune Deficiency Syndrome
LGBT/Q	Lesbian, Gay, Bisexual, Transgender / Queer
MSHRC	Midlands Sexual Health Research Collaborative
NSFG	National Survey of Family Growth
MSHRC	Midlands Sexual Health Research Collaborative
SEM	Social Ecological Model
STD / STI	Sexually-Transmitted Disease / Sexually-Transmitted Infection

I. INTRODUCTION

Background

"Whether we like it or not, newspapers, as a part of the health machine, are here to stay."
- W. A. Evans, 1916

"It can be well imagined that there are a large number of people in this country whose only source of information, other than back fence gossip, is their radio receiving set. It was this bewildering new medium for the spreading of information that your Committee on Health Education wished to examine with a view toward using it more effectively."
- A. Blanchard, 1935

"We believe [television] to be the best and most effective manner of communicating to our public the efforts and programs of their health agency. We urge you, make your annual report a greater vehicle of education through television."
- S. R. Christensen, 1958

"Assuming that computers are becoming a more integral part of our personal and professional lives… what remain to be determined are the goals of a particular health education program and the relative merits of computers versus other delivery media."
- D. Lieberman, 1992

"Social media is a powerful tool that offers collaboration between users and a social interaction mechanism for a range of individuals… Research into the application of social media for health communication purposes is an expanding area."
- S. Moorhead, 2013

Health Communication: Progress in the last hundred years

The past century has seen rapid innovations in mass communication, and each new advance in reaching the masses has been accompanied by a mix of skepticism and hope among health educators and public health workers.

Like any process, health communication has evolved over time as resources, technology, and the increased availability of information from many sources have transformed how people learn about health; with these changes, the definition of health communication has evolved as well. Health communication has been defined as “the art and technique of informing, influencing and motivating individual, institutional and public audiences about important health issues” (Ratzan et al., 1994); as a “process for the development and diffusion of messages to specific audiences in order to influence their knowledge, attitudes and beliefs in favor of healthy behavioral choices” (Smith and Hornik, 1999); and as the “scientific development, strategic dissemination, and critical evaluation of relevant, accurate, accessible, and understandable health information communicated to and from intended audiences to advance the health of the public” (Bernhardt, 2004). Drawing from and adding to these definitions of health communication, it will here be defined as the process of developing, disseminating, exchanging and evaluating the effectiveness of evidence-based information to educate, influence and motivate people about health.

Establishing a Sociological Perspective

Health communication is not confined to the healthcare setting; rather, it is an essential feature of interventions across domains of public health which, as the name suggests, is the protection of the health of a population or of populations. Health communication takes place anywhere people learn about health – whether in a doctor’s office, a community organization, a school, an employee health program, or even one’s own home. As public health interventions take place across levels of society, health communication is deeply rooted in the field of sociology. This research examined how the application of a sociological construct – social location – can influence health communication efforts; specifically, how social location can inform the development of a tool to measure and assess access to health information.

Social Location

When it comes to describing populations, the field of public health uses several common overarching terms that summarize the labeling of social groups: demographic factors, cultural factors, sociodemographic factors, and social determinants of health, to name a few. These terms emphasize the variety of elements that can influence a person's health behaviors and health outcomes. *Social location* is a parallel term from the field of sociology that incorporates a similar set of factors but emphasizes a more holistic perspective of how their combination places individuals in unique positions in society and in social systems. The renowned sociologist Peter Berger put it this way:

> "To be located in society means to be at the intersection point of specific social forces. Commonly one ignores these forces at one's peril. One moves within society within carefully defined systems of power and prestige." (Berger, 1963, p. 67).

Kirk and Okazawa-Rey (2006) define social location as "where all the aspects of one's identity meet… it determines the kinds of power and privilege we have access to and can exercise, as well as situations in which we have less power and privilege." We can gather from both of these definitions that our social location places us within the bounds of the social forces that define us. However, Berger (1963) noted that there is hope: inasmuch as we may seem to be puppets to the forces of social location, there is power in being able to identify and analyze the ‘strings’ that influence us. Such is the goal of public health research and the motivation for this study.

Assessing Social Location in Health Research

Previous studies have examined the influence of social location on health-related topics such as access to health care and services (Andersen & Newman, 2005; Kennedy et al., 2012), self-management and informed decision making (Austin, 2005; Devine, 2005; Horrocks & Johnson, 2014), community involvement (Paceley, Oswald, & Hardesty, 2014), inequities in health status (Lynam, 2005; Pearson & Geronimus, 2011), health behavior and lifestyle (Backett & Davison, 1995), neighborhood effects on psychological morbidity (mental health) (Gatrell, Popay & Thomas, 2004), and substance abuse and psychological distress (Tenorio & Lo, 2011).

For each application of a social location framework, factors specific to the population and outcome of interest are considered. A framework of access to health services developed by Andersen and Newman (2005) includes characteristics of the health system, technology and social norms, and individual determinants including predisposing factors such as demographics, placement in social structure, and health beliefs; enabling factors such as family and community resources; and perceived and evaluated illness level. Kennedy et al. (2012) add to this model the idea of help attainment to understand how people evaluate their need for help and then seek, access, and utilize help to meet their needs.

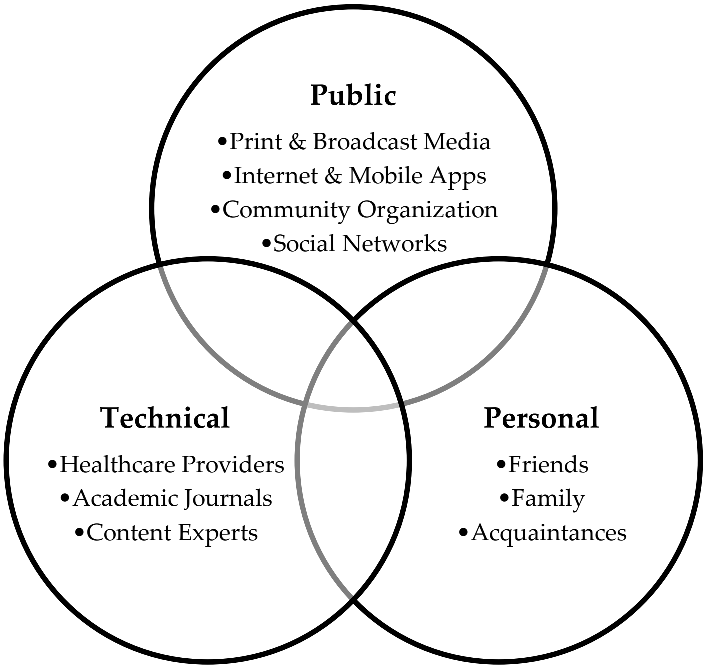
Similarly, Paceley, Oswald, & Hardesty (2014) consider race, education, social status and identity factors such as sexual orientation, importance of sexual orientation identity, degree of disclosure of sexual orientation, gender (male, female, transgender) in their assessment of factors that influence involvement in LGBTQ community organizations. Tenorio and Lo (2011) include marital status and religiosity as aspects of social location in their study of the co-occurrence of substance abuse and psychological distress, while Gatrell, Popay & Thomas (2004) look at geographical aspects of social space to understand mental health disparities in four areas of northwest England. A common theme in these studies is that one's social location as represented by the whole of these factors determines, to a large extent, one's level of social privilege.

Understanding Access to Health Information

Sources of Health Information

The essential components to any health communication effort are its informational content and how the content is conveyed, which to a large extent depends on its source. Goodnight (1999) developed a framework of communication which can easily be applied to the examination of sources of health information. The framework is composed of three spheres – public, technical, and personal. In the public sphere are information sources that are widely available, including the Internet, mass media, and marketing and advertising. The technical sphere is composed of informational sources with high skill or expertise, such as health professionals or scientific publications. Relationships are the core of the personal sphere; here friends, family, and acquaintances can act as sources of health information. As Figure 1 illustrates, sources of information may exist in more than one sphere. A mobile app connecting users to local health care providers could be a public-technical source, while a health-themed group on a social network could be a public-personal source.

Figure 1 - Health Application of Goodnight's Communication Framework



Source: Goodnight, G. T. (1999). The personal, technical, and public spheres of argument. ***Contemporary Rhetorical Theory: A Reader,*** **251-264.**

Disparities in Health Information Access

The concept of "access to health information" or "health information access" incorporates both the sources from which people learn about health, as well as the ability to make use of those sources. Disparities in health information access exist when contextual factors – as can be measured through a social location framework – influence the availability of information sources or the ability to access such sources if available.

Longo (2005) put forward a health information model in which contextual and personal factors jointly influence the search for and use of health information. Contextual factors include the structure of the health care system, the information environment, whether health information is sought for oneself or on behalf of another, and social networks and support. Personal factors include demographic and socioeconomic indicators, culture, language, health attitudes and behaviors, current health status, self-efficacy, and the extent to which individuals believe they control events and circumstances in their lives (Longo, 2005; Shieh, Broome & Stump, 2010). In addition to contextual and personal factors, characteristics of the communication channels themselves can affect the accessibility and usability of health information (Geana & Greiner, 2011).

The sources through which people learn about health information can influence the quality of information they receive (Yi, Yoon, Davis, & Lee, 2013). Lack of access or barriers to reliable, accurate, and relevant information can lead to lower health knowledge and poor health outcomes (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011). Understanding how social location influences health information access can help us address such disparities through improved methods of health communication.

Research Questions

The purpose of this research is to explore how application of social location theory may improve data collection on health information access in order to better inform and improve the effectiveness of health communication and messaging. This dissertation proposes a framework based on the idea of social location to understand how people obtain health information. This research addresses the extent to which three studies of health information access support the use of such a framework, and how its application could improve our understanding of access to health information, and correspondingly, our methods of health communication.

To examine the extent to which such a framework may be generally applied, three recent surveys that measure access to health information were utilized. The surveys differed in terms of topic, population, scope, source, and methodology (see Table 1). Examining a diverse selection of data sources on health information access provided an indication of the similarities and differences between them in terms of their approach to understanding health information access, as well an opportunity to compare and contrast the relative strengths and weaknesses of each in representing social location.

Table 1 - Description of Data Sources

	Topic	Population	Scope	Source	Methodology
Chapter 2	General health information sources	Adults (age 19-96)	Douglas County, NE	Douglas County Community Health Survey, 2013	Population-based telephone survey
Chapter 3	Sexual health information sources	Teens and young adults (age 15-24)	National	National Survey of Family Growth, 2011-2013	Computer-assisted personal interview
Chapter 4	Internet as health information source	LGBT adults (age 19-70)	State of Nebraska	Midlands LGBT Community Needs Assessment, 2010	Online survey

The next three chapters of this dissertation analyze each of these data sources respectively. The chapters are organized in order of relative generalizability of population characteristics. Chapter 2 assesses how elements of social location influence the type and number of sources from which a representative sample of the adult population in Douglas County, Nebraska obtains information about general health topics. Chapter 3 examines how elements of social location are associated with a specific health topic – sex education – among teens and young adults in the United States. Chapter 4 addresses the association of elements of social location with use of a specific information source - the Internet – to obtain health information among a specific population – LGBT (lesbian, gay, bisexual, & transgender) adults in Nebraska. The research questions for each chapter are outlined in Table 2.

Table 2 - Research Questions

	Research Questions
Overarching	1. Could the application of a framework based on the ideas of 'social location' improve the effectiveness of measures of health information access? 2. If so, how could such a framework improve our understanding of health information access?
Chapter 2	1. How are elements of social location associated with the use of different sources of health information? 2. How are elements of social location associated with access to health information?
Chapter 3	1. How are elements of social location associated with sources of sex education for teens and young adults (age 15-24)? 2. How are elements of social location associated with the kind of sex education received by teens and young adults (age 15-24)?
Chapter 4	1. How are elements of social location associated with the use of the Internet to find health information for LGBT adults in Nebraska?

All of the surveys incorporate a core set of elements of social location, but each survey also contains measures that represent unique elements of social location, as outlined in Table 3.

Table 3 - Elements of Social Location in the Surveys of Interest

Elements of Social Location	Douglas County Community Health Survey, 2013	National Survey of Family Growth, 2011-2013	Midlands LGBT Community Needs Assessment, 2010
Age	X	X	X
Sex	X	X	X
Race	X	X	X
Ethnicity	X	X	X
Employment / Occupation	X	X	X
Income	X	X	X
Health Insurance	X	X	X
Health Care Provider	X	X	X
Nativity	X	X	X
Education	X	X	X

Health Status	X	X	X
Relationship Status	X	X	X
Place of residence		X	X
Family Background		X	
Current Religion		X	
Religion Raised		X	
Religious Attendance age 14		X	
Language		X	
Sexual Experience		X	
Sexual Minority		X	X
Transgender			X
Cost Barrier to Care			X
Outness to Health Care Provider			X
Perceived Discrimination			X
Perceived Autonomy			X

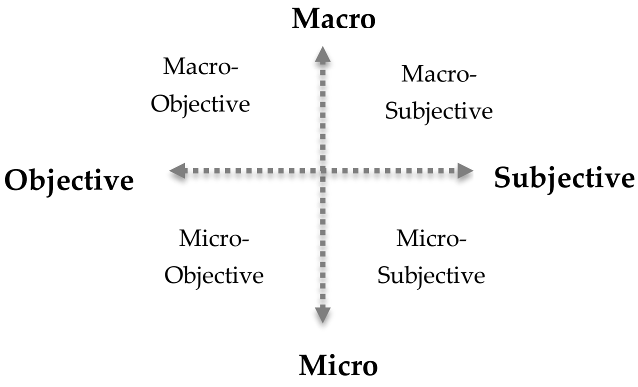
Chapter 5 focuses on the application of a novel framework to identify and define the elements of social location that have the greatest impact on access to health information in each survey. The chapter also synthesizes findings from evaluation of the three surveys to develop recommendations on measuring elements of social location as determinants of access to health information, and discusses the implications of such an approach on the development and effectiveness of health communication methods as health information sources continue to evolve.

Developing a Social Location Framework for Health Communication

Theoretical Background

George Ritzer proposed a model of sociological analysis which he called the “Integrated Sociological Paradigm” (Ritzer, 1979). Central to this paradigm are levels of social reality portrayed as interdependent and interacting dimensions defined by two continuous axes: macroscopic (macro) to microscopic (micro) and objective to subjective (Ritzer & Bell, 1981; see Figure 2). As Ritzer and Bell describe it, the macro-micro continuum “relates to the magnitude of social phenomena,” while the objective-subjective continuum “refers to whether the phenomena has a real material existence… or exists only in the realm of ideas and knowledge” (p. 967). Ritzer and Bell also note that these levels are not to be interpreted as mutually exclusive: rather, each of these domains “gradually [blend] into the others as part of the larger social continuum, but we have made some artificial and rather arbitrary differentiations in order to be able to deal with social reality” (p.967). Ritzer and Bell describe the two macro levels as ‘social facts’ – the generally immutable elements of society, such as organizations and social trends or norms. They describe the micro-objective quadrant as ‘social actions’ and the micro subjective quadrant as ‘social definitions’.

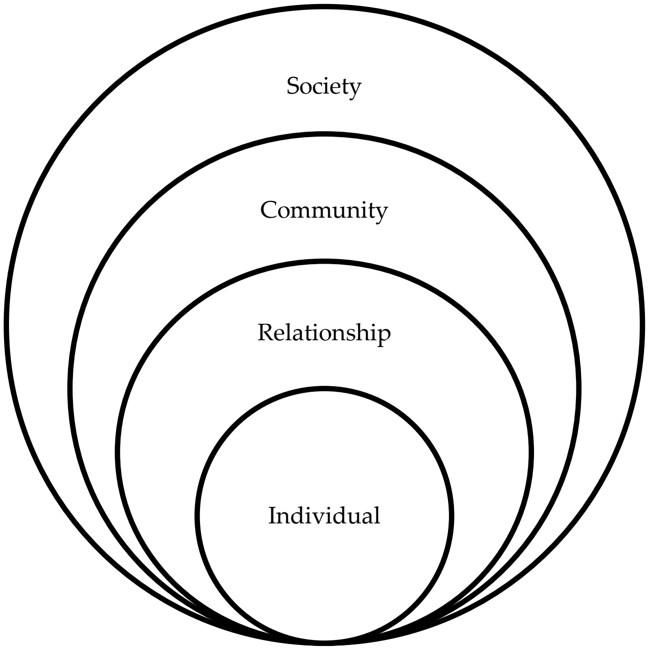
Figure 2 - Ritzer & Bell's Major Levels of Social Reality



Source: Ritzer, G., & Bell, R. (1981). Emile Durkheim: Exemplar for an integrated sociological paradigm. ***Social Forces*****,** ***59*****(4), 966-995.**

The social ecological model (SEM) represents a systems-level approach to understanding and influencing health. Based on the multilevel ecological model developed by Brofenbrenner (1977), the SEM was developed for the field of health by McLeroy, Bibeau, Steckler & Glanz (1988). The model of McLeroy et al. is well-known in the field of health promotion and categorizes determinants of health according to five levels of influence: intrapersonal, interpersonal, organizational, community, and public policy. Recent iterations of the model condense the determinants into four levels: individual, relationship, community, and societal (Dahlberg & Krug, 2002). These models expand on and further define the micro-macro spectrum described by Ritzer, and the interaction between and interdependence of the levels along this spectrum can be better visualized in their portrayal as nested circles (see Figure 3). However, while objective and subjective elements are included in these models, they are not typically differentiated as such.

Figure 3 - The Social Ecological Model

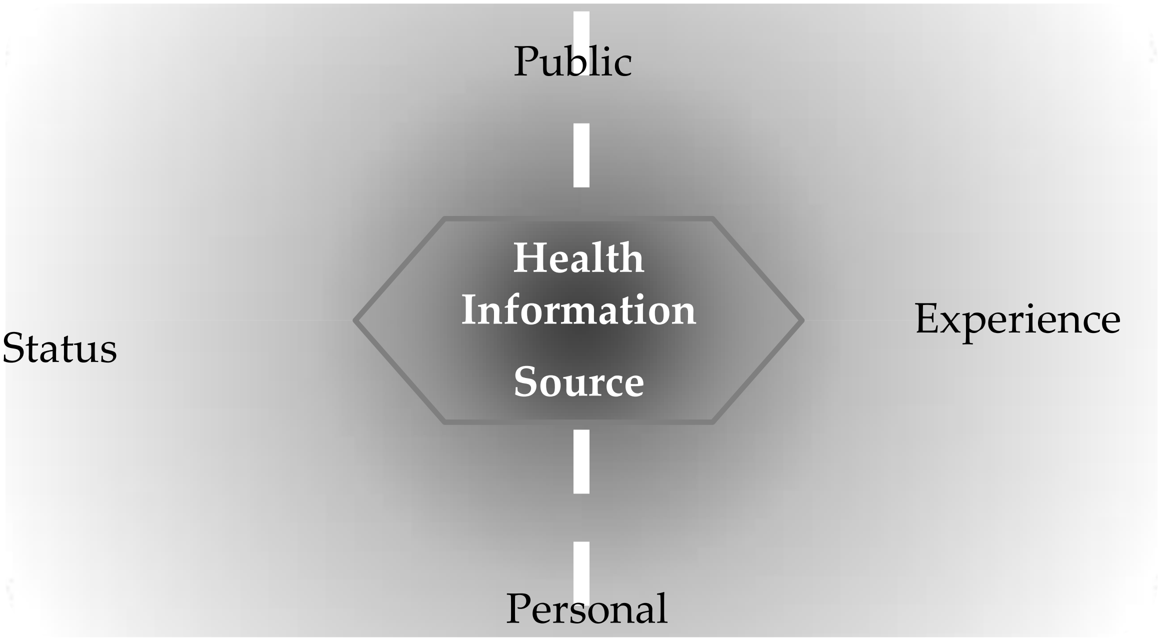


Source: Dahlberg, L. L., & Krug, E. G. (2002). Violence-a global public health problem. In: Krug E, Dahlberg LL, Mercy JA, Zwi AB, Lozano R, (Eds). ***World Report on Violence and Health.*** **Geneva, Switzerland: World Health Organization: 1–56.**

Proposed Framework

Drawing on the work of Ritzer and Bell (1981) and Dahlberg & Krug (2002), I propose that a multilevel framework which intentionally incorporates both objective and subjective measures of social location can improve the scope and potential impact of measures of health information access. While the nested arrangement of the SEM more accurately depicts the interrelatedness between micro to macro levels of society than the 'coordinate' visualization of Ritzer and Bell's levels of social reality, it lacks the added depth of differentiation between objective and subjective components of each. An additional benefit of the SEM is that its terminology is more relatable and less technicalsounding than that of Ritzer and Bell. I propose a framework that 1) visually depicts the interconnectedness of the micro to macro levels; 2) visually depicts "access" as an objective; and 3) uses more relatable terminology to facilitate easier translation into a social location measurement tool (see Figure 4).

Figure 4 - Proposed Kelley Social Location Framework



There are four key components to this framework:

- Status and Experience Domains. These domains are more distinct but there is still room for influence between them. The Status domain represents Ritzer and Bell's *objective* dimension, while the Experience domain represents the *subjective* dimension. To determine which domain to assign an element of social location, we apply a rather Cartesian principle. Rene Descartes famously posited, "I think, therefore I am." Along the same lines, if an element of social location can best be described as a thought, feeling, belief, perspective, or other cognitive function it lies in the Experience domain. If it can best be described as an action, behavior, or state of being it lies in the Status domain. These domains are separated by a dotted line to acknowledge that they interact - static characteristics have experiential meanings and likewise, experiences occur within static contexts. However, each of these domains is important – how one exists within society and how one experiences that existence are two different things, and each has effects on health decisions, behaviors, and outcomes.

- Personal – Public Continuum. As a visual representation of their interconnectedness, there is no strict division between the personal (micro) and the public (macro). Elements of social location fall closer to the bottom of the framework the more they relate to the self; they fall closer to the top the more they relate to other people.
- Health Information Source. The health information source represents not only a channel of information, but also the social context in which it exists and the quality of informational content it provides.
- Access Gradient. The darker center of the gradient represents perfect access to health information, while the lighter edges represent lack of access to health information. This gradient will become useful as we learn which elements of social location hold more significance for accessing health information.

Assignment of elements of social location to this framework might seem a rather arbitrary process, so we will look at a few examples. Age is one of the most often and easily-measured elements of social location. Although certain experiences are more common with age, age itself is a state of being: an individual *is* a number of years old.

While age might influence generational associations, it is more of a personal characteristic than a public one. The placement of age on the access gradient will depend on the significance of its effect on access to a health information source for the population being studied. Different age groups might lie at different points on the gradient.

Race is one of the most often-measured but difficult-to-define elements of social location. While public health studies often utilize Census categories for consistency, the fluctuation of those categories over time reflects the fluidity of such social constructs. Is race a status or an experience? For the purposes of health research, race is generally considered a status that influences personal experience – it is the nature of that influence that is under study. However, the extent to which one identifies with race as a cultural identity, or to which one experiences differential treatment based on perception of race demonstrates the interconnectedness of the Status and Experience domains. Is race a personal or public characteristic? Insofar as it is assigned based on physical traits it is personal; however, insofar as it is a measure of group identity and shapes how one moves within and among social structures and institutions, it is public. In this framework it would lie somewhere in the middle of the personal-public continuum. As was the case with age, different racial categories would lie at different points on the access gradient based on their relative significance in determining access to a health information source.

The Discussion chapter of this dissertation analyzes the elements of social location outlined in Table 3 to provide the basis for exploring the potential of this framework to inform the measurement and understanding of access to health information.

Significance of Contribution to the Field

How we learn about disparities in access to health information depends a great deal on how the construct is measured. Existing measures of health information access – including those examined in this dissertation – include a range of explanatory factors that sometimes intersect and sometimes do not. This is the first known application of a social location framework to the gathering of data on health information access. It is different than other health-related applications of social location in two respects. First, drawing on Ritzer and Bell's (1981) levels of social reality, it intentionally separates – inasmuch as possible - objective and subjective factors as they relate to health information access. In other health-related social location-based frameworks such aspects are lumped together as components of the social level in which they exist. In this framework, objective and subjective factors each contribute uniquely to the understanding of health information access, emphasizing the intentional incorporation of both into measures of social location. Second, this study describes the proposed framework as it can be used to assist in the development of measures of access to health information. The use of such a tool with which to design and assess data gathering on health information access could improve consistency between data sources, and correspondingly improve the quality and applicability of related research. The ability of health communication researchers to compare and contrast a similar set of constructs across different domains of health information access could greatly improve our understanding of the factors that influence how people obtain health information. This improved understanding could be a valuable addition to the growing set of tools available to help health workers better design, disseminate, and evaluate health communication efforts across many health-related domains.

II. DISPARITIES IN HEALTH INFORMATION ACCESS: RESULTS OF A COUNTY-WIDE SURVEY AND IMPLICATIONS FOR HEALTH COMMUNICATION[1]

Abstract

Health knowledge and behavior can be shaped by the extent to which individuals have access to reliable and understandable health information. Based on data from a population-based telephone survey of 1,503 respondents of ages 18 and older living in Douglas County, Nebraska in 2013, this study assesses disparities in health information access and their related covariates. The two most frequently reported sources of health information are Internet and health professionals, followed by print media, peers, and broadcast media. Relative to non-Hispanic whites, blacks are more likely to report health professionals as their primary source of health information (OR=2.61, $p<0.001$) and less likely to report peers (OR=0.39, $p<0.05$). A comparison between whites and Hispanics suggests that Hispanics are less likely to get their health information through Internet (OR=0.51, $p<0.05$) and more likely to get it from broadcast media (OR=4.27, $p<0.01$). Relative to their counterparts, participants with no health insurance had significantly higher odds of reporting no source of health information (OR=3.46, $p<.05$). Having no source of health information was also associated with an annual income below $25,000 (OR= 2.78, $p<.05$ compared to middle income range) and being born outside of the

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[1] The material in this chapter is in press:
Kelley, M. S., Su, D., & Britigan, D. H. (in press). Disparities in health information access: Results of a county-wide survey and implications for health communication. *Health Communication*. Reprinted by permission of Taylor & Francis LLC (http://www.tandfonline.com).

United States (OR=5.00, p<.05). Access to health information is lowest among society's most vulnerable population groups. Knowledge of the specific outlets through which people are likely to obtain health information can help health program planners utilize the communication channels that are most relevant to the people they intend to reach.

Introduction and Literature Review

Access to reliable, understandable health information is a key component of health literacy, defined as “the degree to which individuals have the capacity to obtain, process, and understand basic information and services needed to make appropriate decisions regarding their health” (Nielsen-Bohlman, Panzer & Kindig, 2004). How and whether a person obtains health information can influence their health behavior, health care access, health outcomes, and quality of life. The purpose of this study was twofold; first, we examined differences in the use of health information sources based on age, sex, race and ethnicity, marital status, education, employment, income, insurance status, self-rated health, access to a health care provider, and place of birth. Second, we identified correlates of primary health information sources (health professionals, Internet, broadcast media, print media, and peers) and of degree of access to health information. Finally, we discussed the implications of our findings for developing tailored health communication approaches for specific groups.

In a systematic review of current literature on health literacy, Berkman, Sheridan, Donahue, Halpern and Crotty (2011) found that low health literacy was associated with higher rates of hospitalization and use of emergency health services, lower use of preventive health care, lower ability to understand medication instructions, and poorer ability to interpret health messages. Health information seeking behavior (HISB) describes the process by which individuals search for health-related information. Longo (2005) put forward a health information model in which contextual and personal factors jointly influence HISB and use of health information. Contextual factors include the structure of the health care system, the information environment, whether health information is sought for oneself or on behalf of another, and social networks and support. Personal factors include demographic and socioeconomic indicators, culture, language, health attitudes and behaviors, current health status, self-efficacy, and the extent to which individuals believe they control events and circumstances in their lives (Longo, 2005; Shieh, Broome & Stump, 2010).

The sources through which people learn about health information can influence the quality of information they receive (Yi, Yoon, Davis, & Lee, 2013). Individuals may resort to different health information sources depending on their motivation for seeking information (Abrahamson et al., 2008). For example, Britigan, Murnan, and Rojas-Guyler (2009) found in a Hispanic sample that 61% of respondents reported referring to medical sources for general health information, but when seeking health information during or before an illness more respondents reported using media sources than medical sources for health information.

Based on the communication framework developed by Goodnight (1999), sources of health information can be ascribed to three overarching spheres: technical, public, and personal. The technical sphere comprises sources with high levels of knowledge or expertise in a particular area, such as health professionals, peer-reviewed journals, and scientific publications. The public sphere is made up of sources that are widely available, such as mass media, health-related marketing and advertising, and the Internet. The personal sphere is based on relationships – friends, family, and acquaintances who may act as sources of health information. These spheres can sometimes intersect, as when websites directly convey research-based health information (public and technical) or when a trusted friend is also a physician (personal and technical) or when online forums act as social support (public and personal). Characteristics of the communication platforms within each of the spheres of communication can affect the accessibility and usability of health information (Geana & Greiner, 2011), especially for individuals with limited English proficiency (Yip, 2012).

Information sources from the technical sphere, such as health professionals and authoritative health publications, are highly-trusted sources of health information (Friedman & Hoffman, 2003; Hesse et al., 2005; Smith, 2011). Gutierrez, Kindratt, Pagels, Foster, & Gimpel (2014) found that, regardless of health literacy level, patients using both private and public clinics relied on their health care provider for health information. Patients are more likely to seek alternative sources when they have an unmet need for additional health information or emotional support, or when they anticipate privacy concerns or stigma in communicating with their health care providers (Karras & Rintamaki, 2012; Lee & Hawkins, 2010; Magee, Bigelow, DeHaan & Mustanski, 2012).

The rise of the Internet has transformed the public sphere of communication; it can simultaneously be a source of information and a forum for social support (Nambisan, 2011). Moorhead et al. (2013) conducted a systematic review of the use of online social media for health communication and found several key benefits: the participatory nature of social media allows users to interact with others, share relevant information, and receive and provide support. Social media can be used for public health surveillance and as a tool to influence health policy. Additionally, through social media users can access information in a way that is tailored to their individual interests. Although the Internet is a channel to a wealth of information, the sources from which that information comes may or may not be reliable, accurate, or objective (Chou, Prestin, Lyons, & Wen, 2013). Trust in online health information is influenced by source expertise, argument quality, perceived information quality, and perceived risk (Yi, Yoon, Davis, & Lee, 2013), but people who look for health information online may not know where to find credible, non-commercial sources (Lima-Pereira, Bermúdez-Tamayo, & Jasienska, 2012).

While the Internet is in theory available to all, disparities in access to and use of online information persist (Kontos, Emmons, Puleo, & Viswanath, 2012; Lorence & Park, 2007; Miller & West, 2009; Morey, 2007; Zach, Dalrymple, Rogers, & Williver-Farr, 2012). Use of the Internet to find health information is associated with younger age, female sex, higher education, higher income, higher literacy, higher self-rated health, and skill in Internet use (Dobransky & Hargittai, 2012; Ellis, Mullan, Worsley, & Pai, 2012; Ghaddar, Valerio, Garcia, & Hansen, 2012; Hesse et al., 2005; Koch-Weser, Bradshaw, Gualtieri, & Gallagher, 2010; Lee et al., 2012; Percheski & Hargittai, 2011; Reinfield-Kirkman, Kalucy, & Roeger, 2010; Shieh, Mays, McDaniel, & Yu, 2009). The use of more traditional information sources for health information – such as broadcast and print media – has been associated with different characteristics. Cotten and Gupta (2004) found that, while health professionals were the most-cited source of health information for both those who sought health information online and those who sought health information offline, people who did not go online to find health information were likely to be older, less educated, to have a lower income, and to have lower self-reported health and happiness. Friedman & Hoffman (2003) found that, in their sample of older cancer patients, print media came second to physicians as a source of health information. Use of broadcast and print media as sources of health information is associated with intermediate levels of health literacy (Ellis, Mullan, Worsley, & Pai, 2012); for instance, Clayman, Manganello, Viswanath, Hesse, and Arora (2010) found that Hispanics born outside of the United States but comfortable speaking English reported higher exposure to broadcast and print media compared to those who were less comfortable speaking English.

Although there are many sources of information in online and traditional media, interactions with peers – friends, family, and colleagues – can still be important sources of health information. Use of peers for health information has been associated with younger age, older age, lower income, lower education, and higher health literacy (Kutner, Greenburg, Jin, & Paulsen, 2006; Marrie, Salter, Tyry, Rox, & Cutter, 2013; Smith, 2011; Viswanath & Ackerson, 2011).

Research Questions

The research questions for this study are: (1) how are demographic and socioeconomic factors associated with individuals' primary sources of health information; and (2) how are demographic and socioeconomic factors associated with access to health information? Answers to these questions may assist health care providers and public health professionals in identifying effective means by which to communicate health information, as well as identifying population groups with the lowest access to health information.

Methods

Data

The data for this study come from the Douglas County Community Health Survey (DCCH), a population-based telephone survey conducted by the Survey Research Center at the University of Nebraska Medical Center in the summer of 2013 to assess health needs and trends among residents in Douglas County, Nebraska. The survey included questions on self-reported health and health behaviors, use of health care services, knowledge of the Patient Protection and Affordable Care Act, expectations of community-based health programs, and demographic information. The target population is residents aged 18 years or older with an oversample of minority and rural residents in Douglas County, Nebraska. The sampling frame of the survey was based on telephone numbers generated through the Genesys Sampling system, providing a comprehensive coverage of both landline and cellular telephones eligible for the survey.

The use of standard Random Digit Dialing (RDD) and Computer Assisted Telephone Interviewing technique made it possible for the survey to generate a probability sample in which analytical results can be generalized to the study area. Altogether 1,503 participants completed the survey in either English or Spanish. The overall response rate, combining both landline and cell phone interviews, was 39.8 percent.

Study Variables

Information on sources of health information was captured by the open-ended question, “where do you usually get information on health and health care resources?” Responses were coded as (1) family members, friends, neighbors and/or relatives; (2) newspapers, books, or magazines; (3) Internet; (4) TV or radio; (5) doctors, nurses, pharmacists, and other health care providers; (6) health education seminars/workshops; or (7) other. For this analysis, we transformed this question into two outcome variables: primary health information source and number of health information sources. For the first, we identified participants’ first responses to the question and categorized them as health professional (doctors, nurses, pharmacists, other health care providers, or health education seminars/workshops), Internet, broadcast media (TV or radio), print media (newspapers, books, or magazines) and peers (family, friends, neighbors, relatives). Responses originally coded as “other” were analyzed and recoded if appropriate. For the second outcome variable, we quantified the number of responses given to the question into zero, one, or two or more sources of health information.

Independent variables included demographics, socioeconomic status, self-rated health, and health care access indicators. Demographic characteristics included age in years (18-30, 31-60, 61-99), sex (male or female), marital status (married/partnered or not), and nativity (born in United States or elsewhere). Responses to survey questions on race and ethnicity were combined into one race / ethnicity variable (non-Hispanic White, non-Hispanic Black, Hispanic, and Other). Three-level variables were created for educational attainment (less than high school, high school graduate, some college, college graduate), employment status (employed, unemployed, and retired or unable to work), and annual household income (less than $25,000; $25-75,000; $75,000 and above). Self-rated health was transformed into a binary variable (excellent/very good or less than very good). Categories for age, employment status, household income, and health status were created based on distribution of the data; additional categories within those variables would have resulted in groups too small for meaningful analysis. Educational attainment categories were in line with those commonly used by the National Center for Education Statistics (see Aud et al., 2013). Health care access indicators assessed whether patients had health insurance (yes / no) and whether respondents had a personal doctor or health care provider (yes / no). Self-reported English proficiency (speaks English very well or less than very well) was initially included in this analysis, but was removed due to its strong correlation with the nativity variable (r=.511). The questions on nativity and English proficiency were derived from the 2012 American Community Survey; all other independent variable questions were selected from the

2012 Behavioral Risk Factor Surveillance Survey (Centers for Disease Control & Prevention, 2012; US Department of Commerce, 2012).

Analyses

Associations between selected explanatory variables and sources of health information were first assessed using chi square (χ^2) analyses. Binary logistic regression was conducted to identify significant associations with type and number of health information sources among respondents in our sample after controlling for the effect of selected variables on age, sex, race / ethnicity, marital status, education level, employment status, annual household income, health insurance status, self-rated health, health care provider, and nativity.

The data were weighted using a three-step process of calculating design weights, adjusting for non-response, and then raking to match the sample to population totals. The design weights were based on the number of population members and sample members in each stratum and the number of telephones and adults within each household. Design weights were adjusted for non-response using a factor calculated as the number of sample members in each stratum divided by number of respondents in that stratum. Finally, the data were adjusted using raking methods to match the respondent characteristics in age, gender, race, and education to population totals obtained from the American Community Survey 2007-2011 5-year averages. All analyses were run with the weighted sample in SPSS (version 21).

Results

Table 4 shows the distribution of demographic characteristics and health access indicators across the sample. Most variables had a missing response rate of around 1% or less, but income was not recorded for 15% of participants. A total of 1,503 individuals completed the survey (see Table 4). More than half of the survey respondents were between the ages of 31-60 years (52.8%), followed by 18-30 years (27.1%) and 61-99 years (20.2%). Just over half of respondents were female (51.5%) and a similar proportion were married or partnered (53.8%). Non-Hispanic white respondents made up 73.0% of the sample, non-Hispanic Black 12.0%, Hispanic 11.0%, and 4.0% were of other races (Asian, Native American, or Other). Most participants were born in the United States (89.7%). Over one-third of respondents had a college degree (35.5%), nearly one-third had attended some college (30.6%) , nearly one-quarter had a high school education (23.3%), and 10.1% had less than a high school education. Two-thirds of respondents were employed (67.0%), nearly one-fifth were retired or unable to work (19.4%), and 13.6% were unemployed. Annual household income was more evenly distributed: 38.9% reported an income of between $25,000 to less than $75,000, 35% of $75,000 and above, and 26.1% of less than $25,000. Most respondents had health insurance (86.6%) and a majority of participants had a health care provider (75.5%). Health status was reported as “excellent or very good” among 58.8% of respondents. Most variables had a missing response rate of around 1% or less, but income was not recorded for 15.3% of respondents.

Figure 5 shows the distribution of primary health information sources in the sample. Health professionals and the Internet were the most commonly-cited primary sources of health information, accounting for 72.3% of respondents in the sample. Less commonly-cited sources of health information include peers, print media, and broadcast media.

Tables 5 and 6 depict demographic characteristics and health access indicators by primary health information source and number of health information sources. Primary health information source varied significantly for each independent variable. Health professionals were the most commonly-reported primary source of health information for participants in the oldest age group (44.2%), for participants who were non-Hispanic Black (54.4%) or other races (47.8%), for females (40.8%), for participants with the lowest levels of education (51.3%) and income (45.9%), and for participants who were retired or unable to work (48.2%) or were born outside of the United States (44.1%). The Internet was the most commonly-reported primary source of health information for the youngest age group (46.5%), for males (38.0%), for college graduates (42.0%), for those who were employed (43.0%), who had a higher income (42.0%), and who were in excellent or very good health (40.2%). The Internet was also the primary source of health information for participants who were uninsured (42.6%) and for those who did not have a health care provider (54.0%). While no one group seemed to rely on broadcast media, it was most highly reported as a primary source among Hispanic participants (12.0%) and those who were born outside of the United States (10.2%). Print media was most highly reported as a primary source of health information among the oldest age group (21.3%) and among those who were retired or unable to work (17.1%). For both groups, the proportion who reported print media as the primary source of health information is comparable to the proportion who reported Internet as the primary health information source. Finally, peers were most highly reported as a primary health information source by over one-fifth of the youngest age group (21.7%) and among participants who were not married or partnered (16.8%).

Number of health information sources varied significantly for all selected explanatory variables except marital status and health status. Having no source of health information was most commonly reported among participants who were Hispanic (11.3%) or of other or multiple races (10.0%), who had less than a high school education (12.4%) or income (9.6%) or were born outside of the United States (14.5%). Having two or more sources of health information was most commonly reported among participants who were female (22.3%), non-Hispanic Black (28.8%), who were college graduates (19.6%), had a health care provider (19.7%) or were born in the United States (18.8%).

Tables 7 and 8 present covariates that were significantly associated with primary health information sources and number of health information sources after controlling for the effect of included variables in the logit models.

Sources of Health Information

Health professionals

Participants who had a health care provider had over three times the odds of reporting a health professional as the primary source of health information compared to those who did not (OR=3.07, p<.001). Odds were also higher for those who were retired or unable to work (OR=1.83, p<.01), or did not have health insurance (OR=2.23, p<.01). Participants with less than a high school education had between two and three times the odds of reporting a health care provider as a primary health information source compared to those with a high school education or more. Non-Hispanic Black participants and participants of other or multiple races had over twice the odds of reporting a health care professional as a primary health information source compared to non-Hispanic Whites (OR=2.61, p<.001, OR=2.61, p<.01 respectively).

Internet

The Internet as a primary health information source was associated with female sex (OR=1.39, p<.05), being married or partnered (OR=1.53, p<.01), having a high school education or more (OR=4.64 high school, 7.42 some college, 5.60 college graduate, all p<.001), and not having a health care provider (OR=2.78, p<.001). Participants in the oldest age group had less than half the odds of reporting the Internet as a primary information source compared to those in the youngest age group (OR=0.45, p<.01), and participants who were unemployed or retired or unable to work had lower odds of doing so compared to those who were employed (OR=0.60, p<.05, OR=0.40, p<.001 respectively).

Broadcast Media

Hispanic participants had nearly five times the odds of reporting broadcast media as a primary source of health information compared to non-Hispanic White participants (OR=4.27, p<.01). Use of broadcast media as a primary source of health information was also highly associated with retirement or inability to work (OR=4.20, p<.01 compared to those who were employed) and by high income (OR=4.59, p<.01).

Print Media

Age was significantly associated with the use of print media as the primary health information source. Compared to 18-30 year-olds, 31-60 year-olds had nearly ten times the odds (OR=9.40, p<.001) and 61-99 year-olds had over fifteen times the odds (OR=15.15, p<.001) of relying on print media. The use of print media for health information was also associated with less than high school education (compared to some college, OR=3.45, p<.01). Males had more than twice the odds of using print media compared to females (OR=2.50, p<.001). Print media was also associated with low income (OR=2.70, p<.05 compared to highest income), excellent or very good health (OR=1.68, p<.05), and having a health care provider (OR=2.16, p<.05).

Peers

Participants who were married or partnered had significantly lower odds of reporting peers as a primary health information source compared to those who were not (OR=0.40, p<.001). Non-Hispanic Black participants had lower odds of reporting peers as a primary health information source compared to non-Hispanic White participants (OR=0.39, p<.05).

Number of Health Information Sources

No Source of Health Information

Relative to their counterparts, participants with no health insurance had significantly higher odds of reporting no source of health information (OR=3.46, p<.05). Having no source of health information was also associated with annual income below $25,000 (OR= 2.78, p<.05 compared to middle income range) and being born outside of the United States (OR=5.00, p<.05). Females had over twice the odds of reporting zero sources of health information compared to males (OR=2.33, p<.05).

Two or More Sources of Health Information

Reporting two or more sources of health information was associated with having at least a high school education (OR>7.4, p<.001 for high school, some college, and college graduate) and being born in the United States (OR=5.69, p<.01). Female participants had more than twice the odds of reporting two or more sources of health information compared to males (OR=2.22, p<.001), and non-Hispanic Black participants had nearly three times the odds compared to those who were non-Hispanic White (OR=2.89, p<.001). Participants who were employed had significantly higher odds of reporting two or more sources of health information compared to those who were unemployed (OR=1.75, p<.05).

Discussion

The results of this survey suggest that in Douglas County, Nebraska, a mix of socioeconomic and demographic factors influence disparities in health information access and use. Education, employment, access to a health care provider, and race / ethnicity appear to be notable indicators of the use of certain sources of health information, while advanced age, low income, lack of health insurance, and being born outside of the United States may put people at risk for having no access to health information. Knowledge of the specific outlets through which people are likely to obtain health information, and an ability to identify those at risk of no health information access, can help health professionals and program planners utilize the communication channels that are most relevant to the people they intend to reach.

The results of our survey suggest that in Douglas County, Nebraska, health professionals play an important role in conveying health information to socioeconomically disadvantaged individuals. Results from the National Assessment of Adult Literacy show that nearly half of adults who never attended or did not complete high school have below basic health literacy, compared to 14% of the general population (Kutner, Greenburg, Jin, & Paulsen, 2006). The fact that people with less than a high school education had nearly three times the odds of citing a health professional as a primary health resource in our study underscores the fundamental importance of health literate communication between health care providers and patients. There is an established and growing body of research on best practices for health literate communication in the health care setting (Baker et al., 1996; Kripalini et al., 2010; Parker & Gazmararian, 2003; Schillinger, Bindman, Wang, Stewart, & Piette, 2004; Sheridan et al., 2011; Williams, Davis, Parker, & Weiss, 2002; Wynia & Osborn, 2010); evidence-based methods include using plain language to communicate clearly, using the teach-back method to confirm understanding, and limiting the numeracy skills required of patients (Keller, Sarkar, & Schillinger, 2013). These recommendations support those of Gaglio, Glasgow, and Bull (2012) who found that health care providers are an important source of health information for individuals with low health literacy.

Health professionals were also an important source of health information for non-Hispanic Blacks and individuals of other or multiple races; this highlights a need for health professionals to provide information that is not only health literate, but also culturally competent (Beach et al., 2005; Betancourt & Green, 2010; Lie, Lee-Rey, Gomez, Bereknyei, & Braddock, 2011). It is worth noting that respondents without health insurance and those who were retired or unable to work had higher odds of reporting a health professional as their primary source of health information – a result that seems counterintuitive. It is possible that their access to health care providers could be due in part to the presence of two federally qualified health centers and the state's Veterans Affairs Medical Center within Douglas County, as the purpose of both organizations is to provide access to affordable health care to vulnerable populations such as these. Additional research would be needed to understand the extent to which these organizations impact access to health information by the uninsured and underserved in Douglas County.

People who used the Internet to find health information tended to be younger, more educated, and employed, a result that is consistent with national trends (Koch-Weser, Bradshaw, Gualtieri, & Gallagher, 2010; Lorence & Park, 2007). Also consistent with previous findings was the lower likelihood of Hispanic participants to use the Internet to find health information compared to non-Hispanic Whites (Peña-Purcell, 2008). It is noteworthy that people who had no regular health care provider had nearly three times the odds of using the Internet to find health information compared to those who did, suggesting that people without access to a regular health care provider may have to resort to the Internet for health information.

Recent innovations in online applications which enable the creation of user-generated content reinforce concerns about the reliability of health information online; Adams (2010) outlines concerns specifically related to content producer qualifications, information quality, the illusion of online anonymity and privacy, and a general unawareness of the storage and external use of personal health data made available online. As innovations in online and mobile media enable new ways to communicate and obtain health information, health care providers and public health professionals will need to understand characteristics, motivations, and health needs of individuals who will likely be reached with these new technologies, as well as monitor them to ensure accuracy and protect patient safety (Dalrymple, Rogers, Zach, Turner, & Green, 2013; Pandey, Hasan, Dubey, & Sarangi, 2013; Rai, Chen, Paye, & Baird, 2013).

While the use of broadcast and print media may not raise such concerns about personal vulnerability, questions about content are valid (Chou, Prestin, Lyons, & Wen, 2013). Whereas Internet users are able to seek out information specific to their needs, consumers of broadcast and print media have less control over the content that is made available to them. Nelson et al. (2004) refer to this as a "push" and "pull" – while the Internet allows users to "pull" information at their discretion, more traditional forms of media "push" information to the consumer. Our survey results suggest that, although broadcast media and print media were least-reported as primary sources of health information, users of broadcast media were more likely to be Hispanic or retired or unable to work, while users of print media were more likely to be male, to have lower education and income, and to have a regular health care provider. Use of print media as a primary health resource was much more prevalent among the middle and oldest age groups, although a comparable percentage of those in the oldest age group used print media as used the Internet as a primary source of health information. Although broadcast and print media are often used in mass health communication efforts, this study supports other work that suggests that their utility as channels of health information may only be realized for certain audiences (Gaglio, Glasgow, & Bull, 2012).

For over half of our sample (51.8%) some form of media – Internet, broadcast, or print – was a primary source of health information. These forms of media provide access to many information sources, but media content providers may have different motivations and standards in regards to the health information they publish (Young, Alhabash, Rodgers, & Stemmle, 2011). In addition, consumers may not critically evaluate the sources from which they obtain health information (Bates, Romina, Ahmed, & Hopson, 2006; Robertson-Lang, Major, & Hemming, 2011). For these reasons, it is important for health care providers to be cognizant of the sources patients use to learn about health and to discuss with patients where to find reliable information related to their health concerns. Public health workers also play an important role in their capacity to incorporate principles of media literacy into health communication efforts and social marketing campaigns. Media literacy is defined as the "ability to access, analyze, evaluate, and communicate information in a variety of forms, including print and non-print messages" (National Association for Media Literacy Education, 2014), but despite its relevance, there is limited research on its incorporation into health promotion and communication (Bergsma & Carney, 2008; Brown & Bobkowski, 2011).

People who referred to peers as a primary health information source were more likely to not be married or partnered, and less likely to be non-Hispanic Black. This is the first known study to suggest an association between marital status and reliance on peers for health information. Our finding implies that the use of peer networks as a means to promote health information use or referral may be more efficient and helpful for those who are uncoupled than for those who are coupled.

Knowledge of the specific barriers that prevent access to health information can help policy makers and health professionals improve the efficacy of health communication efforts by increasing focus on the populations with the lowest access to health information. In our sample, people who reported no source of health information were likely to be of older age, low income, uninsured, or born outside of the United States. This study adds to the evidence that low-income, uninsured immigrants have unmet needs in accessing health information (Clayman et al., 2010). Community health workers, ethnic media sources, and development of health education materials that reflect cultural norms, values and language preferences are promising channels to reach this vulnerable segment of the population (Koskan, Friedman, & Messias, 2010; Oh, Kreps, Jun, Chong, & Ramsey, 2012; Todd & Hoffman-Goetz, 2011).

In the search for health information, some people are able to access more sources of information than others. In our sample, high education and being a native of the United States were the strongest predictors of having multiple sources of health information. High school education, English language fluency, and familiarity with American culture and customs may increase ability to access health information as well as comfort in doing so. Although these factors are associated with higher health literacy, it is worth noting that 44% of high school graduates and 11% of college graduates have a below intermediate health literacy level (Kutner, Greenberg, Jin, & Paulsen, 2006); even individuals with high levels of education benefit from health information presented in health literate ways (Longo et al., 2010).

Limitations

This study had several limitations. First, respondents participated through telephone interviews, so our sample was limited to respondents with telephone access who were available at the time of the call. The response rate of 39.8 percent in this study also calls for caution before our findings can be generalized to other counties or regions in the United States. Second, while the survey provided useful information on primary sources of health information, it did not ask the respondents whether they selected their primary source of health information out of personal preference or as a result of limited access to alternative sources. This could be a topic for future research to better understand the contributing factors to disparities in health information access. Finally, the modest sample size in the study has to a certain extent restricted our ability to reliably assess explanatory variables associated with the less commonly reported health information sources such as print media, broadcast, and peers. Despite these limitations, this study represents a rare effort in providing a county wide assessment of primary sources of health information and the factors associated with disparities in health information access.

Conclusion

Health information access is influenced by both quality and quantity of health information sources. To be effective, health communication efforts should be based upon a solid understanding of the health information needs of the intended audience. The rapid evolution of communication technology and advances in personalized health monitoring will provide new opportunities for health communication as the boundaries that separate consumers and producers of health information dissipate (Macario, Ednacot, Ullberg, & Reichel, 2011; Neter & Brainin, 2012). As technology evolves, so too must our approaches to health communication. While many health communication campaigns rely on print and broadcast media to distribute health messages, the utility of doing so may be limited, as these media were least-cited as primary sources of health information. However, these sources may be useful for outreach to specific audiences. Access to health information is lowest among society's most vulnerable population groups. As the gatekeepers to evidence-based health information, health care providers and public health professionals have both the opportunity and the responsibility to use health literate and culturally competent methods when conveying information to patients and the public. Continued study of the evolution of health information sources, trends in their use, and barriers to access will increase the relevance and impact of health communication and will support the efforts of health workers to reduce disparities in health information access and use.

Tables

Table 4- Demographic Characteristics and Health Access Indicators among Douglas County Survey Participants, N=1,503

Variables	n (adjusted %)	Missing
Age in years		20
18-30	401 (27.1)	
31-60	783 (52.8)	
61-99	299 (20.2)	
Sex		0
Female	774 (51.5)	
Male	729 (48.5)	
Race / Ethnicity		19
Non-Hispanic White	1084 (73)	
Non-Hispanic Black	178 (12)	
Hispanic	163 (11)	
Other (Asian, Native American, other)	59 (4)	
Marital Status		9
Married or Partnered	803 (53.8)	
Not Married or Partnered	691 (46.2)	
Education		7
Less than High School	152 (10.1)	
High School Only	350 (23.4)	
More than High School	994 (66.4)	
Employment		9
Employed	1001 (67)	
Unemployed	204 (13.6)	
Retired or Unable to Work	289 (19.4)	
Annual Household Income		230
Less than $25,000	332 (26.1)	
$25,000 - <$75,000	496 (38.9)	
$75,000 and above	445 (35)	
Health Insurance		12
Insured	1291 (86.6)	
Not Insured	199 (13.4)	
Health Status		1
Excellent or Very Good	884 (58.8)	
Less than Very Good	618 (41.2)	
Health Care Provider		28
Has Health Care Provider	1114 (75.5)	
Does not have Health Care Provider	362 (24.5)	
Nativity		5
US Native	1343 (89.7)	
Born outside of US	155 (10.3)	

Table 5 - Associations between Sample Characteristics and Primary Health Information Source and Number of Sources

	Primary Health Information Source (%)						Number of Sources (%)		
Variables	Internet	Health Professional	Peers	Print	Broadcast	*p-value*	Zero	2+	*p-value*
Age (years)						***			*
18-30	46.5	27.9	21.7	1.4	2.5		3.0	13.0	
31-60	38.9	36.2	9.0	10.7	5.2		5.6	18.8	
61-99	19.1	44.2	9.7	21.3	5.6		6.1	19.8	
Sex						***			***
Female	35.5	40.8	10.1	9.2	4.4		5.8	22.3	
Male	38.0	30.1	15.0	12.2	4.7		4.9	11.9	
Race / Ethnicity						***			***
Non-Hispanic White	38.2	31.7	14.3	11.7	4.1		3.4	17.3	
Non-Hispanic Black	29.7	54.4	9.5	5.7	0.6		7.6	28.8	
Hispanic	34.5	33.8	8.5	11.3	12.0		11.3	7.5	
Other	41.3	47.8	0.0	6.5	4.3		10.0	10.0	
Married or Partnered						***			
Yes	38.0	34.9	9.1	12.7	5.4		3.8	17.6	
No	35.0	36.4	16.8	8.3	3.5		6.2	17.1	
Education						***			***
Less than High School	18.2	51.2	8.3	14.9	7.4		12.4	6.6	
High School	33.8	34.8	13.1	11.1	7.2		6.0	18.0	
More than High School	40.2	33.8	12.6	10.0	3.3		3.4	18.8	
Employment						***			**
Employed	43.0	31.5	13.4	9.2	2.8		4.3	18.1	
Unemployed	31.3	38.0	14.1	9.4	7.3		3.0	14.7	
Retired or Unable to Work	18.0	48.2	8.2	17.1	8.6		9.0	17.3	

*Note: Significance of association determined by χ^2 analysis. * p<.05, ** p<.01, *** p<.001*

Table 6 - Associations between Sample Characteristics and Primary Health Information Source and Number of Sources (cont'd)

	Primary Health Information Source (%)						Number of Sources (%)		
Variables	Internet	Health Professional	Peers	Print	Broadcast	*p-value*	Zero	2+	*p-value*
Annual Income						**			***
Below $25K	29.7	45.9	9.5	10.5	4.4		9.6	16.0	
$25-$75K	39.7	34.7	10.7	11.3	3.6		2.4	17.1	
$75K and above	42.0	32.3	12.4	8.5	4.7		2.4	17.8	
Has Health Insurance						*			**
Yes	35.6	35.2	12.9	11.7	4.6		3.9	18.0	
No	42.6	38.6	10.2	4.5	4.0		8.9	14.1	
Health Status						***			
Excellent or Very Good	40.2	30.8	14.4	11.3	3.2		5.0	15.9	
Less than Very Good	31.8	42.2	9.7	9.9	6.3		5.7	19.2	
Has Health Care Provider						***			***
Yes	31.2	39.8	12.5	12.1	4.3		2.3	19.7	
No	54.0	21.5	12.5	6.4	5.5		8.1	11.3	
Nativity						***			***
US Native	37.0	34.6	13.6	10.7	4.0		4.0	18.8	
Born Outside of US	32.3	44.1	2.4	11.0	10.2		14.5	4.8	
Number of cases (n)	488	473	166	143	60		73	239	

*Note: Significance of association determined by χ^2 analysis. * p<.05, ** p<.01, *** p<.001*

Table 7 - Binary Logistic Regression Results: Primary Health Information Source and Number of Sources

	Primary Health Information Source ‡					Number of Sources ‡	
Variable	Internet	Health Professional	Peers	Print	Broadcast	Zero	2+
Age (years)							
18-30	1.00	1.00	1.00	1.00	1.00	1.00	1.00
31-60	0.82	0.96	0.61	9.40 ***	1.27	1.70	1.14
61-99	0.45 **	1.30	0.71	15.15 ***	0.77	4.05 *	1.32
Sex							
Female	1.39 *	1.25	0.72	0.40 ***	0.87	2.33 *	2.22 ***
Race / Ethnicity							
Non-Hispanic White	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Non-Hispanic Black	0.71	2.61 ***	0.39 *	0.62	0.17	0.19 *	2.89 ***
Hispanic	0.51 *	1.22	0.75	2.09	4.27 **	0.50	0.84
Other	0.74	2.61 **	0.01	0.77	0.96	1.70	1.04
Marital Status							
Married or Partnered	1.53 **	1.13	0.40 ***	0.93	0.69	0.66	1.31
Education							
Less than High School	1.00	1.00	1.00	1.00	1.00	1.00	1.00
High School Graduate	4.64 ***	0.42 **	1.11	0.46	3.20	0.88	7.42 ***
Some College	7.42 ***	0.33***	1.29	0.29 **	1.50	1.68	7.41 ***
College Graduate	5.60 ***	0.40 **	1.13	0.56	0.88	0.46	7.68 ***
Employment							
Employed	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Unemployed	0.60 *	1.29	1.3	1.72	1.10	0.27	0.57 *
Retired or Unable to Work	0.40 ***	1.83 **	0.98	0.65	4.20 **	0.65	0.62

*Note: ‡ Results presented as odds ratios.; * p≤.05, ** p≤.01, *** p≤.001; 1.00 = referent group*

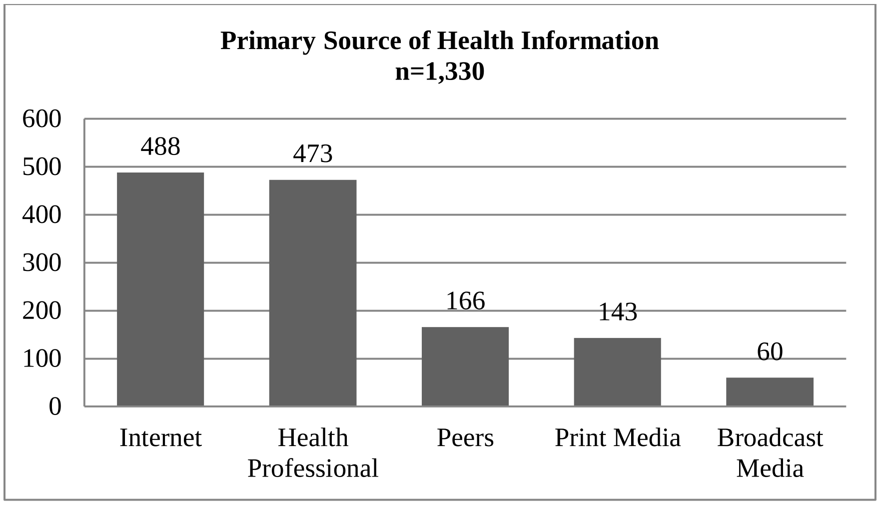
Table 8 - Binary Logistic Regression Results: Primary Health Information Source and Number of Sources (cont'd)

	Primary Health Information Source ǂ					Number of Sources ǂ	
Variable	Internet	Health Professional	Peers	Print	Broadcast	Zero	2+
Annual Income							
Below $25K	1.00	1.00	1.00	1.00	1.00	1.00	1.00
$25-75K	0.98	0.94	1.17	0.72	1.68	0.36 *	0.83
Above $75K	0.81	0.99	1.75	0.37 *	4.59 **	0.94	0.73
Health Insurance							
None	0.79	2.23 **	0.54	0.54	0.44	3.46 *	1.00
Health Status							
Excellent / Very good	1.11	0.85	1.07	1.68 *	0.57	1.57	0.74
Health Care Provider							
Has Health Care Provider	0.36 ***	3.07 ***	0.79	2.16 *	0.65	0.44	1.48
Nativity							
US Native	0.98	1.12	2.47	1.02	0.36	0.20 *	5.69 **
Constant	0.32	0.3	0.12	0.03	0.05	0.14	0.00
Number of cases (n)	425	404	122	109	48	41	198

*Note: ǂ Results presented as odds ratios.; * p≤.05, ** p≤.01, *** p≤.001; 1.00 = referent group*

Figures

Figure 5 - Primary sources of health information among Douglas County sample (n=1,330)



III. HOW TEENS AND YOUNG ADULTS LEARN ABOUT SEX: HEALTH INFORMATION ACCESS DISPARITIES IN THE NATIONAL SURVEY OF FAMILY GROWTH, 2011-2013

Abstract

Objectives. The goal of this research was to examine how elements of social location are associated with a specific health topic – sex education – among teens and young adults in the United States.

Methods. This study examined sources of sex education (formal, parents, and doctor) and topics covered with each source (abstinence, STDs, and contraception) among a nationally-representative sample of 15-24 year-old male and female respondents to the 2011-2013 National Survey of Family Growth. We used complex samples analysis in SPSS 23 to assess significant correlates of each sex education source and topic.

Results. We found health care access (as measured by health insurance status and access to a health care provider), sex, education, race, religion, and sexual experience to be consistently significant predictors of what and from whom young people learn about sex. Access to sexual health information was lower for those with limited health care access, and exposure to particular sex education messages varied significantly. The results of this study can be used by youth workers, families, and policy makers to inform the development of effective approaches to sex education for America's youth.

Introduction

Sexuality is one of the most fundamental elements of the human experience; the formative years of adolescence and young adulthood play a critical role in sexual development, behavior, and health outcomes well into adulthood. Sexual activities and decisions during these years can influence exposure to sexually-transmitted infections, the likelihood of unintended pregnancy and parenthood, and even adult sexual functioning (Ryan, Franzetta, Manlove, & Schelar, 2008; Sandfort, Orr, Hirsch, & Santelli, 2008). Sex education – what young people learn about sex and sexuality and from whom - can influence key sexual behaviors in adolescence and young adulthood, including age at first sex, use of contraception, use of sexual health services, and likelihood of engaging in unsafe sexual practices (Bourke, Boduszek, Kelleher, McBride, & Morgan, 2014; Dehlendorf, Rodriguez, Levy, Borrero, & Steinauer, 2010; Doskoch, 2012b; Kohler, Manhart, & Lafferty, 2008; Kubicek, Beyer, Weiss, Iverson, & Kipke, 2010; Lindberg & Maddow-Zimet, 2012; Secor-Turner, Sieving, Eisenberg, & Skay, 2011). Incomplete or inaccurate sex education can contribute to teen pregnancy and childbearing, the spread of sexually-transmitted infections, and unrealistic expectations about sex and relationships (Dudley, Crowder, & Montgomery, 2014; Kirby, Lepore, & Ryan, 2005; Kubicek, Beyer, Weiss, Iverson, & Kipke, 2010; Trenholm, Devaney, Fortson, Clark, Bridgespan, & Wheeler, 2008). In order to meet the needs of young people growing up in an ever-changing sexual landscape, it is imperative to provide relevant, accessible sex education and resources. To do this, we must better understand how young people obtain information about sex and sexuality - the sources from which they gather information and the content of their education about sex to better inform the priorities and direction of future sex education efforts.

Sources of sex education

Formal Sources

Formal educational sources – such as schools, faith-based organizations, and community-based organizations – are a common source of sex education for young adults. The school environment plays a role in the content and effectiveness of sex education in the classroom. Charmaraman, Lee, & Erkut (2012) analyzed sex education questions from an ethnically diverse sample of 795 sixth-graders and found that those from schools with higher student-reported sexual activity and sexual permissiveness had more detailed questions about sex (vaginal, anal, and whether it should be painful), contraception, sexual initiation, and their own personal health compared to those from schools with lower student-reported sexual activity and permissiveness. The gender composition of sex education classes played a role as well: questions from students in single-sex sex education programs tended to be more direct than those from students in coed sex education programs. In addition, teachers' comfort and ability in answering students' questions about sex influences students' perceptions of the quality of sex education (Byers, Sears, & Foster, 2013).

Faith-based organizations such as churches and synagogues are often a source of sexual health messages. Freedman-Doan, Fortunato, Henshaw, & Titus (2013) conducted in-depth interviews with religious leaders representing 44 religious organizations with sex education programs geared toward youth. The organizations represented Evangelical Protestant, Catholic, and Mainline Protestant denominations, as well as a few Unitarian churches and a Jewish synagogue. They found that the common goal of most such programs was to promote abstinence and 'sexual purity' among youth, with some incorporating public pledges to abstain from sex until marriage. The influence of faith-based messages about sex and sexuality is addressed in more detail below.

Community-based organizations – such as youth activity programs, non-profit organizations, and service providers – can be a valuable source of sexual health information. A survey of 96 youth-oriented community-based organizations in Indiana – including non-profit and faith-based organizations – found that such organizations were more likely to get questions from youth regarding personal skills and relationships than about sexual behavior and sexual health; however, many organizations offered programming, resources, or referrals on sex education topics and sexual health issues for youth (Fisher, Reece, Wright, Dodge, Sherwood-Laughlin, & Baldwin, 2012).

Parents

While parent-child communication about sexual and reproductive health has increased in recent years (Stidham-Hall, Moreau, & Trussell, 2012) and most parents want to be a source of sex education for their children (Lagus, Bernat, Bearinger, Resnick, & Eisenberg, 2011), many are uncomfortable with the prospect of talking with their children about sex or with discussing particular topics (Farringdon, Holgate, McIntyre,

& Bulsara, 2014; Morawska, Walsh, Grabski, & Fletcher, 2015). Children may also be hesitant to talk with their parents about sex. Barriers to discussing sexual topics with parents include embarrassment, fear of parental reactions, or sexual topics simply never being brought up in the home (Rutledge, Siebert, Chonody, & Killian, 2011). However, parents can play an important role in providing information and perspective on sex and sexual health to their children.

Conversations with parents about sex and sexuality can leave a lasting impression on youth and young adults (Heisler, 2005; Walker, 2004), and can influence children's sexual expectations and behaviors. Although parents may perceive that promoting abstinence to their children will improve their long-term well-being (Elliott, 2010), Hall, Moreau, and Trussell (2012) found in their study of a nationally-representative sample that communication with parents about sex was associated with use of sexual and reproductive health services, except for those respondents who learned only about abstinence. Abstinence-only education from parents was associated with reduced odds of health service use among adolescent females. Crosby, Hanson, & Rager (2009) found in a survey of adolescent females in the South that those who had talked with their parents about a variety of sex education topics – pregnancy, the menstrual cycle, sexually transmitted infections, and methods of birth control – had fewer sex partners, greater self-efficacy in condom use negotiation, were less likely to use alcohol or drugs before having sex, and were more likely to talk about HIV prevention before having sex. There was no such effect for adolescents who learned about the same topics from a formal educational source.

Health Care Providers

Health care providers can play an important role in encouraging or even facilitating conversations about sexuality between parents and children, and can act as advocates of healthy sexuality in schools as well as in the community at-large (Aved & Lobdell, 1984; Clark, Brey, & Banter, 2003; Smith, 2003). Although health care providers seem a logical source of sexual health information for youth, they can remain an untapped resource due to barriers on the side of both patients and providers. Fear of judgment, concerns about privacy, and perceived communication barriers can influence how parents and adolescents perceive health care providers as sources of information related to sexual development (Croft & Asmussen, 1993). Adolescents are more likely to discuss sexual health issues with a provider when they can do so privately (i.e., without a parent present) and when they have positive feelings about doing so (Merzel, Vandevanter, Middlestad, Bleakley, Ledsky, & Messeri, 2004; O'Sullivan, McKee, Rubin, & Campos, 2010; Thrall, McCloskey, Ettner, Rothman, Tighe, & Emans, 2000). On the other side of the interaction, physicians are more likely to address sexual health with patients if they have received communication skills training, if they have been exposed to sexual medicine courses, and if they have more liberal attitudes about sex (Tsimtsiou, Hatzimouratidis, Nakopoulou, Kyrana, Salpigidis, & Hatzichristou, 2006).

Other sources

Peers are a common source of information and discussion about sex for teens and young adults, and communication with peers about sex can play a role in influencing sexual attitudes, behaviors, and expectations (Cates, 2008; Holman & Sillars, 2012; Ragsdale, Bersamin, Schwartz, Zamboanga, Kerrick, & Grube, 2014, Widman, Choukas-Bradley, Golin, & Prinstein, 2014). However, personal beliefs about sex can be stronger predictors of sexual behavior than the perceived attitudes of peers (Akers, Gold, Bost, Adimora, Orr, & Fortenberry, 2011). Informal communication with peers may be more influential than structured peer sex education. Kim and Free (2008) conducted a systematic review of peer-led sexual health interventions and found that while they improved sexual health knowledge, attitudes, and intentions, they did not significantly improve sexual outcomes.

The Internet is becoming a common source of information about sexuality for people of all ages (Daneback, Månsson, Ross, & Markham, 2012). While disparities in Internet access exist, it is increasingly used by youth of diverse backgrounds to learn about issues related to sexuality and sexual health (Dolcini, Warren, Towner, Catania, & Harper, 2015; Jones & Biddlecom, 2011b; Simon & Daneback, 2013). According to a 2010 Pew report, *Social Media and Young Adults*, 72% of young adults go online to seek out health information, and 17% of teens go online to seek out sensitive health information. In addition, digital media such as text messaging and social networking show promise as effective channels of sex education interventions, influencing sexual health knowledge, behaviors, and outcomes among youth who use them (Guse et al., 2012; Strasburger & Brown, 2014; Willoughby & Jackson, 2013). However, youth may have varying levels of comfort utilizing these channels to access sexual health information (Lim, Vella, Sacks-Davis, & Hellard, 2014). Jones and Biddlecom (2011) found that teens who did go online to find information recognize that not all Internet sources are equally credible, but may not always know where to look for reliable information. Entertainment media such as movies, music videos, magazines, and Young Adult fiction can also be a source of information on sex and sexuality for teens and young adults (Bittner, 2012; McDermott, 2011; McKee, 2012; Vandenbosch & Eggermont, 2011; Wegmann, 2013).

Sex education topics

Abstinence

Abstinence-based sex education promotes abstaining from sex as the best way to prevent pregnancy and the spread of sexually-transmitted infections. Abstinence-only-until-marriage sex education programs in the United States have received federal financial support since 1981 (Perrin & DeJoy, 2003). Since then, many studies have been conducted to assess their influence on youth sexual attitudes, behaviors and outcomes, but evidence on their effectiveness in achieving those ends is inconclusive. Chin et al. (2012) conducted a meta-analysis of 23 studies of abstinence education to assess the extent to which they addressed 7 key sexual health outcomes: current sexual activity, frequency of sexual activity, number of sex partners, frequency of unprotected sexual activity, use of protection (condoms and/or hormonal contraception), pregnancy, and sexually-transmitted infections. They found that abstinence education programs may reduce sexual activity, but have no consistent impact on the other six outcomes. In a different approach to measuring the impact of abstinence education programs, Stanger-Hall and Hall (2011) evaluated teen pregnancy and birth rates in 48 U.S. states and found that those states with higher emphasis on abstinence-only education had higher rates of both teen pregnancy and birth even after controlling for socioeconomic factors.

One critique of abstinence-only education is that its moral overtones and underlying assumptions about student (hetero)sexuality can render it either irrelevant for students who do not subscribe to the religious foundations upon which many abstinence messages are based, or damaging for students who have different sexual desires and experiences than those tacitly ‘approved’ in abstinence curricula. Specifically, the heteronormative assumptions inherent in sex education curricula that stress the importance of abstaining from sex until marriage may ring especially hollow for gay, lesbian, bisexual, transgender, and queer youth, or for those who never marry. Worse, they can perpetuate destructive narratives and the spread of misinformation that can exclude, harm, and even dehumanize youth who are not straight, who engage in same-sex sexual interactions, or who do not intend to marry (Fisher, 2009; Kubicek, Beyer, Weiss, Iverson, & Kipke, 2010; McCarty-Caplan, 2015; Santelli, Ott, Lyon, Rogers, Summers, & Schleifer, 2006; Wilkerson, 2013).

An additional challenge for abstinence education is a lack of clear, consistent communication about what abstinence means and why it is important. A survey of teens in New York and Indiana found that while some defined abstinence as abstaining from sex until marriage, others understood it to mean abstaining from sex until one is ready; some defined it as never having had sex, while others defined it as a time period of not having sex, even if one had had sex before (Jones & Biddlecom, 2011a). In addition, the focus of abstinence education on preventing sexual activity until marriage effectively ignores non-reproductive forms of sexual activity. The resulting lack of information about other forms of sexual expression can lead to unsafe sexual practices such as unprotected oral or anal sex (Fehs, 2010; Hans & Kimberly, 2011; Santelli, Ott, Lyon, Rogers, Summers, & Schleifer, 2006).

There are efforts to address these drawbacks. Hess (2010) found that many recipients of federal abstinence education funding find ways to 'soften' the moral message which such education is intended to convey in order to meet the characteristics and needs of the communities they serve. Jemmott, Jemmott, & Fong (2010) report on a theory-based abstinence education program implemented among urban African-American sixth- and seventh-graders that was more effective in delaying sexual activity than both a comprehensive sex education approach and a general health promotion control class. They note that this abstinence education program was unique in that it was based on theories of behavior change, it did not contain inaccurate information about condoms, nor was it based on moralistic arguments. Rather, it focused on abstinence as a way to prevent pregnancy and sexually-transmitted infections, and to enable youth to achieve life goals. It was also targeted specifically to the beliefs and behaviors of its intended audience, therefore the authors caution against using its results to come to conclusions about the efficaciousness of abstinence education in general.

Comprehensive Sex Education

The discussion of methods of safe sex including effective use of condoms and birth control mark the main difference between abstinence education and what is referred to as “comprehensive” sex education. Doskoch (2012b) examined data from the 2006-2008 National Survey of Family Growth and found that youth who learned about both abstinence and contraception had better sexual health outcomes than those who received no sex education.

The “risk reduction” approach of education on safe sex and birth control / contraception has been found to be more broadly effective in improving sexual health behaviors and outcomes than the “risk avoidance” approach of abstinence-only education (Doskoch, 2012a; Kirby, 2008; Kohler, Manhart, & Lafferty, 2008). Comprehensive sex education can foster protective factors against teen pregnancy such as positive attitudes towards condom use, intent to abstain from sex or limit the number of sexual partners, and accurate knowledge about sexual health, HIV infection, sexually transmitted infections (STIs), the importance of abstinence, and pregnancy (Martinez, Copen, & Abma, 2011).

Nearly twice as many states require instruction on abstinence in sex education as require instruction on contraceptive methods, and instruction on the importance of having sex only in the context of marriage is required in more states than contraceptive education (Guttmacher Institute, 2015). This might lead one to believe that there is no support for teaching students about contraception in school, but a number of parent surveys in states across the nation show that not to be the case. A survey of 2,400 parents of children ages 6-11 in the Midwest found that while more than half (51%) supported teaching abstinence in grades 6-8, slightly more (55%) also supported teaching about contraception and condom use at that age or earlier (Dake, Price, Baksovich, & Wielinski, 2014). Similarly, a survey of 1,605 parents in Minnesota found that the majority of parents (89.3%) supported teaching about both abstinence and contraception in middle school sex education (Eisenberg, Bernat, Beringer, & Resnick, 2008). An additional study of 191 culturally diverse parents of school-aged children in the Northeast United States found that 86% of those surveyed supported the teaching of both abstinence and contraceptive use in school-based sex education (Heller & Johnson, 2013). In North Carolina, a state with mandated abstinence education at the time of their survey, Ito, Gizlice, Owen-O'Dowd, Foust, Leone, & Miller (2006) found that a majority of parents (89%) supported the teaching of comprehensive sexuality education in public schools. In Mississippi, a deeply conservative state, a survey of 3,600 non-Hispanic White and African-American parents of public school students found that an overwhelming majority supported the teaching of abstinence plus contraceptive education, including the topics of correct condom use and where to get birth control (McKee, Ragsdale, & Southward, 2014). In fact, repeated national and state-wide surveys of parents over the past 17 years have consistently shown majority support for the implementation of comprehensive sexuality education in schools (Herrman, Solano, Stotz, & McDuffie, 2013).

STIs/HIV/AIDS

Both abstinence education and comprehensive education typically include information about sexually-transmitted infections (STIs) and HIV/AIDS; abstinence education presents them as reasons to not have sex, while comprehensive education presents them as reasons to practice safe sex. Cates (2008) conducted a series of focus groups with youth, parents, health care providers, and policy advocates to better understand how each group understood the issue of youth and sexually transmitted infections. She found agreement on themes related to youth and to society. Contributing factors to STIs in youth were lack of knowledge about STIs, peer pressure related to sexual activity, sexual exploration / experimentation, denial of risk / feelings of invincibility, and indifference to warnings from authority figures. Social contributors to STIs in youth were the framing of sex as a taboo topic, reluctance of parents to communicate with their children about sex, restrictions in school sex education, limited communication from health care providers, a lack of positive role models, and media misinformation. These themes represent a common understanding among the four groups about STIs and youth, and may offer a starting point on how to address STIs in sex education.

Other topics

Other topics, such as personal agency and communication skills in sexual relationships, sexual orientation, teen parenting, and abortion are less often provided in sex education, especially in formal settings, as teachers frequently face structural or institutional barriers to providing education on topics that are considered more controversial (Eisenberg, Madsen, Oliphant, & Sieving, 2013; Widman, Noar, Choukas-Bradley, & Francis, 2014). However, there may be support for expansion of sex education to include a wider variety of topics related to sex and sexuality. A recent survey of 301 Illinois parents of teens by Peter, Tasker, & Horn (2015) found that in addition to wanting their children to receive comprehensive sex education in school, parents were even supportive of including information about sexual identity development and the role of pleasure in sex in sexuality education.

Social Location

There are a number of factors that can influence the sources from which young people get health information and the messages to which they are exposed; the intersection of these many factors is known as one's social location. A discussion of sex education without addressing the role of social location would be incomplete.

Age is one factor in social location. Much of the research related to sex education focuses on high school students. Bradner, Ku, & Lindberg (2000) examined the sources young men use after high school to get information on AIDS, STDs, or condoms. Using the National Survey of Adolescent Males, which followed respondents until age 26, they found that the most frequent source of information was media sources such as television, magazines, or radio (98.2%), followed by family or social connections (50.8%), instructional sources such as lectures or brochures (47.8%),and finally medical sources such as a doctor or nurse (22.3%).

Sources of sex education differ by gender as well. A number of studies have found that parents are more likely to talk with daughters than sons about sex, and to have more conservative attitudes about sex when talking with daughters compared to sons

(Byers, Sears, &Weaver, 2008; Hutchinson, 2002; Cosby & Miller, 2002). Mothers are often the primary or sole providers of sex education for girls in the family (Hutchinson & Cederbaum, 2011). Tobey, Hillman, Anagurthi, & Somers (2011) surveyed a sample of 406 culturally diverse high school students and found that females were indeed more likely to learn about sex from their mothers than their fathers, while males were more likely to learn about sex from their fathers, but also learned about sex from their mothers. Gender-based differences in knowledge, attitudes, and expectations about sex are present even among elementary-aged children. Halstead and Waite (2001) found that in a group of 9- and 10-year old children, boys and girls already had different sources of health information, different areas of interest relating to sex, and different attitudes about sexuality. A survey of African-American 5th-graders found that 56% of boys and 22% of girls anticipated having sexual intercourse in the next 12 months; 18% of boys and 5% of girls already had (Anderson et al., 2011).

Racial and ethnic background can play a role in how families communicate about sex. A study of communication between Latino parents and their children found that, compared to Caucasian parents, they addressed sexual abuse earlier, but sexual reproduction, intercourse, and AIDS later (Kenny & Wurtele, 2013). A separate study found that Latino and African American mothers spoke with both sons and daughters about sex, and that they preferred using a direct and honest approach to discussing timely sex education issues for their children (Murray, Ellis, Castellanos, Gaul, Sutton, & Sneed, 2014).

Culture of origin is an additional factor of social location that can influence whether and how young people access information about sex and sexual health. A series of focus groups and in-depth interviews involving 142 refugee youth in Australia found they had little access to sexual health information, and barriers to accessing sexual health information included concerns about confidentiality and privacy, feelings of shame and embarrassment related to discussing sexual health, and the need to focus on priorities related to resettlement (McMichael & Gifford, 2009). A study of Muslim immigrant mothers and daughters in Illinois found that very little communication about sex happened within families, and it was not uncommon for children in such families to opt out of school-based sex education, although some mothers had the perception that schools could offer more correct information about sex and sexuality than is communicated in the dominant U.S. culture (Orgocka, 2004).

Racial and ethnic background may also influence beliefs about sexual health outcomes. Perceptions about the desirability of teen pregnancy, for example, may be influenced by these factors. Winters and Winters (2012) found that non-Hispanic Black teens are about half as likely as non-Hispanic White teens to feel embarrassed about pregnancy, while Bueno (2013) found that religious and cultural perceptions about contraception, promiscuity, and pregnancy contributed to higher rates of teen pregnancy among Hispanic teens.

Religion is perhaps one of the most influential factors affecting how and what young people learn about sex. Farringdon, Holgate, McIntyre, & Bulsara (2014) found that higher religiosity among mothers is associated with a level of discomfort in addressing certain sexual health topics with their children, specifically masturbation, condoms, abortion, sexual assault, and contraception. In some religious groups, a focus on abstinence from sex until marriage is a core facet of doctrinal teaching for youth – especially for girls and young women – so that being abstinent becomes part of one’s religious identity (Fahs, 2010). Baker, Smith, and Stoss (2015) collected state-level data on religious characteristics and sex education policy, specifically state positions on the inclusion of abstinence or contraception in sex education. Data sources included the 2007 PEW Religious Landscape Survey and information from the National Conference of State Legislatures. The authors found that states with the lowest levels of religious adherence had the highest probability of mandating coverage of contraception, while states with the highest levels of theism had a higher probability of emphasizing abstinence in sex education. However, in a survey of the sexual health topics received by a religiously diverse group of teenagers, Causarano, Pole, and Flicker (2010) found few overall associations between religious affiliation and sexual health topics covered. The only significant findings were that compared to respondents of no religion, Protestants had higher odds of having learned about sexually transmitted infections and Muslim respondents had a lower desire for more sexual health information.

As an additional aspect of religious affiliation, religious attendance is especially associated with beliefs related to sex education and sexual behavior. Heller and Johnson (2013) found a negative correlation between attendance at religious services and support for sex education in schools among a culturally diverse group of parents of school-aged children in the Northeast. Brimeyer and Smith (2012) found that in a sample of 487 college students in the southeast United States, those with high church attendance or who were Catholic were significantly less likely to hook up (have casual sex outside of a relationship) after controlling for sex, race, political ideology, social class, year in college, and student definition of 'hooking up.' Bleakley, Hennessy, and Fishbein (2010) examined the results of the Annenberg National Health Communication Survey, a national online survey that enrolls participants by phone and provides Internet access to enrolled respondents without it. Attendance at religious services and the belief that abstinence education effectively prevents pregnancy were the two factors associated with support for abstinence-only education; religious attendance was associated with less support for instruction on condom use. They conclude that religious and political factors play a stronger role than other demographic characteristics in influencing beliefs about sex education.

It merits noting once more the influence of sexual orientation and gender identity on the impact of sex education, or lack thereof (Fisher, 2009; Kubicek, Beyer, Weiss, Iverson, & Kipke, 2010; Wilkerson, 2013). Sex education curricula that make unfounded assumptions about the sexual lives and identities of students will inevitably be ineffective in providing meaningful information to their audience.

Specific Aims

It is clear that myriad factors influence the provision and impact of sex education; This study is among the first to examine sex education in the 2011-2013 National Survey of Family Growth. This research attempts to provide a more comprehensive exploratory perspective on factors associated with sources of sex education and topics covered among teens and young adults in the United States. The goal of this research was to examine how elements of social location are associated with a specific health topic – sex education – among teens and young adults in the United States. Specifically, this paper assesses the association of elements of social location with sources of sex education and exposure to specific sex education topics in this population.

Research Methods

Data

The data for this study came from the National Survey of Family Growth (NSFG), a multi-stage probability-based nationally representative survey conducted by the National Center for Health Statistics (NCHS) to gather information about family life and reproductive health among men and women in the United States. The first one-year survey cycle was conducted in 1973 and five following cycles occurred in 1976, 1982, 1988, 1995, and 2002. The first four-year cycle was conducted in 2006-2010. The data for this study come from the 2011-2013 dataset for males and females. Between September 2011 and September 2013, in-person interviews were conducted with 10,416 men and women age 15-44 years. The response rate for the survey was 72.8% (National Center for Health Statistics, 2014a). This paper examines sources of sex education among male and female teens and young adults aged 15-24 years old (N=3,895; weighted N=40,279,208).

Study Variables

Survey questions about health information sources and topics were recoded into binary variables to provide yes/no responses to whether respondents had ever received sex education from parents , from a doctor, or from a formal source (defined in the survey questionnaire as “school, church, a community center or some other place”) (National Center for Health Statistics, 2014b). For each of those three sources, the survey assessed what kind of sex education topics each covered; these also were recoded into yes/no binary variables. Possible sex education topics from parents or from a formal source included “STDs,” “how to prevent HIV/AIDS,” “how to use a condom,” “methods of birth control,” “where to get birth control,” “how to say no to sex,” and for formal sources “waiting until marriage.” Possible sex education topics discussed with a doctor included “HIV or other STDs,” “Safe sex or condom use,” and “abstinence.”

For independent variables, NCHS-recoded variables were used wherever possible to ensure consistency between male and female responses. Demographic variables included age (15-17, 18-21, or 22-24 years), sex (female or male), self-rated health (excellent, very good, and good, fair or poor), education (less than high school, high school graduate, some college, or college degree), occupation (employed, unemployed, in school, or other), and annual family income (less than $35,000, $35,000 or more).

Health care access variables included health insurance status (private or Medi-Gap; Medicaid, CHIP, or state-sponsored; Medicare, military, or other government insurance; or single-service plan or not covered), health care provider (private doctor’s office, clinic, hospital/urgent care, or other), and place of residence (principal city of metropolitan statistical area (MSA), other MSA, or not MSA(rural)). The U.S. Census Bureau's 2010 definition of an MSA is "at least one urbanized area of 50,000 or more population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties."

Culture of origin was measured by ethnicity (Hispanic or non-Hispanic), race (White, Black, or other), nativity (US native or born outside of the US), and primary language spoken at home (English, Spanish or other). Family environment was measured by relationship status (married, living with a partner, or single) and family background (two biological/adoptive parents from birth or any other family structure). Religious influence was measured by the variables current religion and religion raised (no religion, Catholic, Protestant, or other) and religious attendance at age 14 (once/week or more, once/month to once/week, less than once/month, or never). Finally, sexuality was measured by the variables sexual orientation (heterosexual/straight or gay/lesbian/bisexual), and sexual experience (has had sex with any partner or has not had sex).

Analyses

The 2011-2013 public datasets for male and female respondents were pooled together and complex sampling analysis was conducted using SPSS version 23 to properly account for the sampling weight and design variables. The dataset was then limited to analyze only data for respondents aged 15-24 years. Frequency analysis was first conducted for all variables to describe characteristics of the weighted sample, followed by chi-square tests of independence to identify significant associations between independent and dependent variables. Finally, logistic regression analysis was conducted to identify significant predictors of the use of any information source after controlling for the influence of other variables; for the subgroup of those who used each information source, additional regressions were run to identify predictors of topics covered with each source. After identifying three sets of highly correlated predictor variables, those variables that contributed less to the model's predictive ability were removed (Tu, Kellett, Clerehugh, & Gilthorpe, 2005). Age and occupation (highly correlated with education for this age group), current religion (highly correlated with religious background) and primary language (highly correlated with ethnicity) were removed from the regression models. Odds ratios and 95% confidence intervals are reported for regression results.

Results

Characteristics of the weighted sample

After removing from the sample respondents who were not between 15-24 years of age, 3,895 respondents (weighted N=40,279,208) were included in this analysis (see Table 9). The weighted sample was evenly divided between males and females (49.2% and 50.8% respectively), and just under one-quarter of respondents rated their health as less than very good (25.9%). Over one-third of respondents had less than a high school education (38.3%), while roughly one-quarter were high school graduates (27.9%) or had some college education (24.8%); College graduates made up 9% of the sample. Over half of the weighted sample was employed (52.8%), over one-quarter were in school (25.9%); the remainder were unemployed (7.9%) or had some other occupation, such as caretaking (13.3%). Just over half of the weighted sample reported an annual family income of less than $35,000 (51.3%).

Over half of the weighted sample had private health insurance or Medi-Gap (51.5%), while about one in five had Medicaid, CHIP, or a state-sponsored plan (22.0%) or had a single-service plan or were uninsured (19.9%). Medicare, military, or other government insurance was the least-used health insurance category (6.6%). Nearly half of the weighted sample visited a private doctor's office for health care (47.9%), but nearly one-quarter had no source of health care (24.5%). Others visited a clinic (18.6%) or a hospital or urgent care center (9.0%) for health care. One-third of the weighted sample lived in the principal city of a metropolitan statistical area (MSA - 33.9%), while half lived in the surrounding areas (50.4%) and the remainder did not live in an MSA (15.8%).

The racial composition of the weighted sample was 68.5% White, 17.1% Black, and 14.4% some other race. People of Hispanic ethnicity made up 21.8% of the weighted sample while the majority were non-Hispanic (78.2%). The vast majority of the weighted sample was native to the United States (90.5%), but one in ten were born elsewhere (9.5%). Likewise, most of the weighted sample spoke English at home (89.6%), but about one in ten spoke a different primary language (7.6% Spanish, 2.8% other). As could be expected for this age group, most of the sample were single (81.8%), although some were living with a partner (12.2%) or married (6.0%). A little more than half of the weighted sample grew up with two biological or adoptive parents from birth (53.2%), while others grew up with a different family structure (46.8%).

In terms of religious following and upbringing, over two-thirds of the weighted sample were Christian (45.6% Protestant, 22.7% Catholic), while nearly one in ten were of a different religion (9.1%) and nearly one-quarter followed no religion (22.7%). However, fewer were raised with no religion (12.5%); over three-quarters were raised as Christians (48.1% Protestant, 29.7% Catholic) and nearly one in ten as a different religion (9.7%). Half of the weighted sample reported attending religious services once per week or more at age 14 (50.2%), while the remaining half was pretty evenly divided between attending once per month to once per week (16.0%), less than once per month (16.2%), or never (17.7%) at age fourteen.

Regarding sexuality, most of the weighted sample were homosexual/straight (92.9%) and a minority were gay, lesbian or bisexual (7.1%). Over two-thirds of the respondents had had sex with any partner (68.4%) and less than one-third had never had sex (31.6%).

Sources of sexual health information and topics covered: Formal

Significant associations.

Formal channels such as schools, churches, or community centers were the most universally-cited sources of health information (see Tables 10-12): 97.3% of respondents had received sex education from one or more of these sources before the age of eighteen.

Although receiving sex education from a formal source was nearly universal in this sample, it was moderately significantly associated with a few independent variables: education (*p*≤.05; 99% among those with a college degree, 96.2% among high school graduates), annual family income (*p*≤.01; 98.7% among those with income of $35,000 or higher, 96.1% among those with less), access to a health care provider (*p*≤.05; 98.6% among those who see a private doctor, 95.7% among those with no health care provider), and relationship status (*p*≤.05, 97.7% among single and 95.9% among cohabiting respondents).

For those who had received sex education from a formal source, most had learned about STDs (92.5%) and how to prevent HIV/AIDS (88.6%). Family income and sexual experience were the only significant correlations for discussing STDs (93.9% of higher income and 91.2% of lower income, *p*≤.05; 94.1% among those with sexual experience and 89.2% among those without, *p*≤.01). While discussing how to prevent HIV/AIDS was significantly higher among those with higher income compared to lower income (90.6% vs. 86.6%, *p*≤..05), private health insurance compared to no health insurance (90.4% vs. 85.2%, *p*≤.05), among those living in urban centers compared to those living in more rural areas (90.0% vs. 81.6%, *p*≤.001), and among those with sexual experience compared to those without (90.3% vs. 85.0%, *p*≤.01).

More than three-fourths of respondents had been taught by a formal source how to say no to sex (83.6%), and about abstinence (waiting until marriage to have sex - 75.6%). Receiving education on how to say no to sex from a formal source was significantly higher among those with higher income compared to lower income (85.9% vs. 81.5%, *p*≤.05), among those with private health insurance compared to those in any other insurance category (*p*≤.05), among those who received health care from a private doctor's office compared to a different or no health care source (*p*≤.001), among people of non-Hispanic compared to Hispanic ethnicity (84.7% vs. 80.0%, *p*≤..01), and among English- and Spanish-speakers compared to those who spoke other languages (*p*≤.05). Receiving instruction on abstinence had a number of significant correlates: it was significantly higher among females compared to males (78.0% vs. 73.2%, *p*≤.05), among those with private insurance compared to those with Medicaid (78.7% vs. 70.9%, *p*≤.01), and among those who received health care from a private doctor compared to other or no sources of health care (*p*≤.01). It was also higher among people of non-Hispanic compared to Hispanic ethnicity (77.7% vs. 67.8%, *p*≤.001), among Black respondents compared to respondents of other races (*p*≤.05), among people born in the United States compared to those born in other countries (76.4% vs. 68.3%), and among those whose primary language is English compared to Spanish or another language (*p*≤.001).

Abstinence education was highly correlated with every religious variable: it was highest among those who were currently Protestant or raised Protestant, and lowest among those who currently professed no religion or who were not raised in a religious tradition (*p*≤.001). Similarly, exposure to abstinence education increased as religious attendance at age 14 increased (p<.001). Finally, a significantly higher proportion of straight respondents had received abstinence education compared to respondents who were gay, lesbian, or bisexual (76.6% vs. 64.7%, $p \leq .001$).

More than half of those who received sex education from a formal source had learned about methods of birth control and how to use a condom (65.4% and 60.4% respectively), but fewer were educated about where to actually get birth control (51.7%). Age, sex, education, occupation, and sexual experience were associated with all three topics, with exposure increasing with age and education ($p \leq .001$) and lowest among those who were in school ($p \leq .01$ for methods, $p \leq .05$ for the others) or who had never had sex ($p \leq .001$). More females than males were educated about methods of birth control (68.3% vs. 62.7%, $p \leq .05$) and where to get birth control (58.9% vs. 44.8%, $p \leq .001$), while more males than females were educated about condom use (63.3% vs. 57.2%, $p \leq .05$). Education on methods of birth control was higher among those with private insurance compared to Medicaid (70.2% vs. 56.8%, $p \leq .001$), among those born outside of the United States compared to U.S. natives (71.3% vs. 56.8%, $p \leq .05$), and among respondents who were married or living together compared to those who were single ($p \leq .001$). Instruction on condom use was higher among those with a higher income (62.7% vs. 58.0%, $p \leq .05$) and among those living in urban centers ($p \leq .05$). Guidance on where to get birth control was lower among those living in rural areas ($p \leq .05$). It was higher among those living with a partner compared to married or single respondents ($p \leq .001$) and among gay, lesbian, and bisexual respondents compared to straight respondents (61.0% vs. 51.2%, $p \leq .05$).

Predictors.

Although sex education from a formal source was reported among the vast majority of the weighted sample, some variables stand out as particularly relevant after controlling for the influence of all independent variables. Use of a formal source to obtain health information (see Tables 13-14) was more likely among those with less than very good (OR=1.85, 95% CI [1.00, 3.43]) or very good self-rated health (OR=1.99, 95% CI [1.00, 3.94]) compared to excellent self-rated health, and for those with a college degree (OR=3.14, 95% CI [1.03, 9.58]) compared to those with less than a high school education. Use of a formal source of sex education was lower among those with no source of health care compared to those who visited a private doctor's office (OR=0.31, 95% CI [0.14, 0.69]) and among those who were married (OR=0.40, 95% CI [0.17, 0.94]) or living with a partner (OR=0.49, 95% CI [0.26, 0.90]) compared to those who were single.

For respondents who received sex education from a formal source, discussion of each topic was associated with a unique set of predictors after controlling for the influence of all independent variables. Discussion of STDs was predicted by growing up in a family with anything other than two biological or adoptive parents from birth (OR=1.71, 95% CI [1.1, 2.46]), by attending religious services at age 14 between once per month and once per week compared to once per week or more (OR=2.18, 95% CI [1.23, 3.88]), and by having sexual experience compared to no sexual experience (OR=2.38, 95% CI [1.41, 4.00]). Discussion of HIV/AIDS was more likely among residents of urban centers compared to rural areas (OR=1.82, 95% CI [1.36, 2.94]), among people of other races compared to White (OR=1.95, 95% CI [1.20, 3.19]), among respondents who never attended religious services at age 14 compared to those who attended them once per week or more (OR=1.53, 95% CI [1.03, 2.27]), and among those who had had sex compared to those who had not (OR=1.75, 95% CI [1.28, 2.44]).

Respondents who received health care from a private doctor's office had about twice the odds of discussing how to say no to sex compared to any of the other possible sources of health care, including none (OR=2.13, 95% CI [1.32, 3.45] compared to hospital or urgent care; OR=1.72, 95%CI [1.28, 2.33] compared to clinic; OR=1.72, 95%CI[1.33, 2.27] compared to none). Receiving education from a formal source on waiting until marriage to have sex (abstinence – see Tables 15-16) was less likely for Hispanic respondents compared to non-Hispanic respondents (OR=0.68, 95% CI [0.50, 0.92]). It also became progressively less likely as religious attendance at age 14 decreased. Compared to those who attended religious services once per week or more, those who never attended had about one-third the odds (OR=0.35, 95% CI [0.25, 0.49]) of learning about abstinence from a formal source. Finally, abstinence education from a formal source was about half as likely for gay, lesbian, and bisexual respondents compared to straight respondents (OR=0.52, 95% CI [0.38, 0.72]).

Education from a formal source on methods of birth control was more likely among those with any form of higher education compared to those with less than a high school education (OR=1.78, 95% CI [1.36, 2.33] compared to high school graduates; OR=2.24, 95% CI [1.77, 2.83] compared to those with some college; OR=2.65, 95% CI [1.72, 4.08] compared to those with a college degree). It was also more likely among those who were born outside of the United States compared to those born in the United States (OR=1.64, 95% CI [1.15, 2.35]), among those living with a partner compared to single respondents (OR=1.45, 95% CI [1.07, 1.97]), and among those who attended religious services at age 14 between once per month and once per week compared to once per week or more (OR=1.54, 95% CI [1.12, 2.14]). It was less likely among those who had any form of health insurance besides private or Medi-Gap insurance and among respondents who had no source of health care compared to those who visited a private doctor's office (OR=0.77, 95% CI [0.59, 0.99]). Education from a formal source on condom use was more likely for males compared to females (OR=1.30, 95% CI [1.05, 1.61]), for high school graduates (OR=1.41, 95% CI [1.07, 1.86]) and those with some college education (OR=1.54, 95% CI [1.14, 2.09]) compared to those with less than a high school education, and for those with a higher compared to lower income (OR=1.29, 95% CI [1.07, 1.55]). It was less likely for respondents with no source of health care compared to those who visited a private doctor's office (OR=0.75, 95% CI [0.59, 0.95]) and for respondents with no sexual experience compared to those who had had sex (OR=047, 95% CI [0.37, 0.59]).

Finally, learning from a formal source where to get birth control was more likely for females compared to males (OR=1.76, 95% CI [1.43, 2.16]); for high school graduates (OR=1.48, 95% CI [1.15, 1.90]), those with some college education (OR=1.69, 95% CI [1.26, 2.26]), and those with a college degree (OR=1.73, 95% CI [1.16, 2.60]) compared to those with less than a high school education; and for those who were raised in a Catholic

(OR=1.53, 95% CI [1.04, 2.25]) or other religion besides Protestantism (OR=1.81, 95% CI [1.05, 3.11]) compared to those raised with no religion. It was less likely for respondents living in rural areas compared to urban centers (OR=0.66, 95% CI [0.43, 0.99]) and for those who had not had sex compared to those who had (OR=0.61, 95% CI [0.49, 0.76]).

Sources of sexual health information and topics covered: Parents

Significant associations.

Nearly three-quarters of respondents had discussed sex education topics with their parents (71.6% - see Tables 17-19). Education from parents was higher among the youngest age group ($p \leq .05$), among females compared to males (75.1% vs. 68.3%, $p \leq .01$), among those who were single compared to married or cohabiting ($p \leq .05$), among Catholics and Protestants compared to those with other or no religion ($p \leq .05$,), and among those who attended religious services at least once per week at age 14. It was lowest among those who were uninsured ($p \leq .001$), did not have a regular source of health care ($p \leq .001$), were born outside of the United States ($p \leq .05$) or spoke a language other than English or Spanish ($p \leq .001$) . Finally, receiving sex education from parents was highest among Black respondents and lowest among those of other races ($p \leq .001$).

The most commonly-discussed topics with parents were STDs (71.6%) and how to say no to sex (69.8%). Significantly more Hispanic than non-Hispanic respondents discussed STDs with their parents (76.9% vs. 70.1%, $p \leq .05$). Discussion of STDs was also more common among gay, lesbian, or bisexual respondents than straight respondents (80.8% vs. 71.2%, $p \leq .05$) and among respondents who had sexual experience compared to those who did not (74.0% vs. 65.9%, *p*≤.01). Receiving education from parents on how to say no to sex was significantly higher for females than for males (79.4% vs. 59.6%, *p*≤.001), for respondents who received health care from a private doctor compared to any other source (*p*≤.01), for respondents of non-Hispanic compared to Hispanic ethnicity (71.9% vs. 62.4%, *p*≤.001), for White respondents compared to those of other races (*p*≤.01), for those of "other" or Protestant religion or religious background (*p*≤.001), and for those who attended religious services at least once per week at age 14 (*p*≤.01). It was lower for high school graduates compared to other educational status (*p*≤.05), for unemployed compared to other occupations (*p*≤.01), for straight compared to gay, lesbian, or bisexual respondents (69.2% vs. 77.7%, *p*≤.05), and for those who had ever had sex compared to those who had not (66.9% vs. 76.6%, *p*≤.01).

More than half of respondents who received sex education from their parents discussed methods of birth control (61.1%), how to prevent HIV/AIDS (57.9%), or how to use a condom (56.5%). Addressing methods of birth control with parents was higher among females compared to males (79.4% vs. 59.6%, *p*≤.001), among White respondents compared to those of other races (*p*≤.001), among respondents born in the United States compared to those born in another country (62.2% vs. 49.1%, *p*≤.01), among those whose primary language was English compared to other languages (*p*≤.001), among those who were not currently religious (*p*≤.01) nor raised in a religion (*p*≤.05). Education from parents regarding methods of birth control was lower among the youngest age group compared to older ages (*p*≤.001), among those with less than a high school education compared to higher education($p \leq .001$), among those who were still in school compared to other occupations ($p \leq .001$), among single respondents compared to those married or cohabiting ($p \leq .001$), among straight compared to gay, lesbian, or bisexual respondents ($p \leq .01$), and among those who had not had sex compared to those who had ($p \leq .001$).

Discussion with parents of how to prevent HIV/AIDS was significantly higher among Black respondents compared to those of other races ($p \leq .05$), among those who grew up with a family structure besides two biological or adoptive parents from birth ($p \leq .05$), among gay, lesbian, or bisexual respondents compared to straight (73.9% vs. 60.3%, $p \leq .01$), and among respondents who had sexual experience compared to those who did not (61.4% vs. 49.7%, $p \leq .001$). Receiving education from parents on how to use a condom was significantly higher among males compared to females (65.7% vs. 47.8%, $p \leq .001$), among the middle compared to younger and older age groups ($p \leq .001$), among Hispanic compared to non-Hispanic respondents (61.6% vs. 55.0%, $p \leq .05$), among Black respondents compared to respondents of other races ($p \leq .01$), among those whose primary language was Spanish compared to other languages ($p \leq .05$), among respondents who were cohabiting ($p \leq .05$), among those who grew up with a family structure other than two biological or adoptive parents from birth ($p \leq .001$), and among those who had sexual experience compared to those who did not ($p \leq .001$). Education on condom use was lower among those with private health insurance compared to other insurance ($p \leq .01$), among those who received health care from a private doctor's office (*p*≤.001), and among respondents raised in a religion other than Protestantism or Catholicism (*p*≤.01).

Less than half of those who discussed sex education with their parents talked about where to obtain birth control (44.7%). Receiving such education from parents was higher among females compared to males (55.1% vs. 33.7%, *p*≤.001), among those born in the United States compared to those born in another country (46.0% vs. 30.8%), among those with a family structure other than two biological or adoptive parents from birth (49.1% vs. 40.9%, *p*≤.01), among respondents who currently had no religious affiliation (*p*≤.001) and who did not grow up with a religious affiliation (*p*≤.05), among gay, lesbian, and bisexual respondents compared to straight (62.0% vs. 43.5%, *p*≤.001), and among those who had had sex compared to those who had not (49.5% vs. 33.4%, *p*≤.001). Learning from parents where to get birth control was significantly lower among the youngest age group (*p*≤.001), among those with less than a high school education (*p*≤.05), among respondents with no health insurance (*p*≤.05), among respondents of a race other than Black or White (*p*≤.01), among those who spoke a language other than English or Spanish at home (*p*≤.001), and among single respondents compared to those who were married or living with a partner (*p*≤.01).

Predictors.

Receiving any form of sex education from parents (see Tables 20-21) was more likely for females compared to males (OR=1.40, 95% CI [1.09, 1.79]). It was less likely for those with no source of health care compared to those who visited a private doctor's office

(OR=0.60, 95% CI [0.44, 0.82]), for those of a race besides Black compared to White (OR=0.65, 95% CI [0.47, 0.89]), for married compared to single respondents (OR=0.54, 95% CI [0.38, 0.77]), for those who never attended religious services at age 14 compared to those who did once per week or more (OR=0.62, 95% CI [0.46, 0.85]), and among those who had not had sex compared to those who had (OR=0.48, 95% CI [0.38, 0.61]).

Among those who received some form of sex education from their parents, discussion of STDs was more likely for those with less than high school education compared to a college degree (OR=1.78, 95% CI [1.04, 3.03]) and for Hispanic compared to non-Hispanic respondents (OR=1.58, 95% CI [1.11, 2.23]); It was less likely for those with Medicare, military, or other government insurance compared to a private plan (OR=0.47, 95% CI [0.25, 0.87]), as well as for those without sexual experience compared to those who had had sex (OR=0.61, 95% CI [0.45, 0.82]). Females were more likely to be taught about how to say no to sex compared to males (OR=2.62, 95% CI [2.06, 3.35]), as were respondents who were Protestant (OR=1.43, 95% CI [1.02, 2.02]) or of another religion besides Catholicism (OR=2.00, 95% CI [1.15, 3.48]) compared to those who were raised with no religion, and those who had not had sex compared to those who had (OR=1.40, 95% CI [1.00, 1.95]). Less likely to discuss with their parents how to say no to sex were those with less than very good self-rated health compared to those with excellent health (OR=0.62, 95% CI [0.42, 0.90]), Black compared to White respondents (OR=0.62, 95% CI [0.45, 0.85]), and respondents who attended religious services at age 14 between once per month and once per week compared to those who attended once per week or more (OR=0.70, 95% CI [0.54, 0.92]).

Respondents who discussed with their parents methods of birth control (see Tables 22-23) were more likely to be female compared to male (OR=2.55, 95% CI [1.99, 3.27]) and to have some college education compared to less than high school education (OR=1.39, 95% CI [1.01, 1.93]). They were less likely to be Black (OR=0.55, 95% CI [0.41, 0.73]) or of another race (OR=0.60, 95% CI [0.40, 0.91]) compared to White, and to have no sexual experience compared to having had sex (OR=0.63, 95% CI [0.48, 0.82]). Receiving education from parents on how to prevent HIV/AIDS was more likely for Hispanic compared to non-Hispanic respondents (OR=1.47, 95% CI [1.01, 2.12]) and for Black compared to White respondents (OR=1.51, 95% CI [1.04, 2.21]). It was less likely for those who had no source of health care compared to those who visited a private doctor's office (OR=0.69, 95% CI [0.49, 0.97]), for respondents who were raised Protestant (OR=0.68, 95% CI {0.46, 1.00}), and for those who had not had sex compared to those who had (OR=0.64, 95% CI [0.47, 0.88]).

Respondents who were educated by their parents on condom use were more likely to be male compared to female (OR= 2.04, 95% CI [1.64, 2.56]), to be Black compared to White (OR=1.58, 95% CI [1.07, 2.32]), and to be living with a partner compared to single (OR=1.49, 95% CI [1.07, 2.08]). They were less likely to have a college degree compared to less than a high school education (OR=0.41, 95% CI [0.23, 0.73]) and to have never had sex compared to having sexual experience (OR=0.40, 95% CI [0.29, 0.54]). Finally, respondents were more likely to have received education from their parents on where to get birth control if they were female compared to male (OR=2.26, 95% CI [1.79, 2.85]) or if they attended religious services at age 14 less than once per month compared to once per week or more (OR=1.51, 95% CI [1.07, 2.15]). Education on where to obtain birth control was less likely for respondents who did not have a health care provider compared to those who visited a private doctor's office (OR=0.67, 95%CI [0.45, 1.00]), for those who were of a race other than Black compared to White (OR=0.64, 95% CI [0.14, 0.98]), for those who were raised Protestant (OR=0.63, 95% CI [0.41, 0.98]) or Catholic (OR=0.64, 95% CI [0.42, 0.97]) compared to those raised with no religion, and for those who had not had sex compared to those who had (OR=0.57, 95% CI [0.40, 0.81]).

Sources of sexual health information and topics covered: Doctor

Significant associations.

Doctors were the least-cited source of sex education for teens and young adults (37.1% - see Tables 24-25). Discussing sexual topics with a doctor was more common in the oldest age group ($p \leq .01$), among females compared to males (42.2% vs. 32.1%, $p \leq .001$), those with lower income compared to higher income (41.0% vs. 32.9%, $p \leq .001$), among those with Medicaid, CHIP, or state-sponsored health insurance ($p \leq .001$), among Black respondents compared to those of other races ($p \leq .001$), among respondents who were living with a partner ($p \leq .05$), among those with a family structure other than two biological or adoptive parents from birth (40.5% vs. 34.0%, $p \leq .05$), among those with higher compared to lower religious attendance at age 14 (*p*≤.05), and among respondents who had sexual experience compared to those who did not (42.5% vs. 25.4%, *p*≤.001).

Among those who did talk with their doctors about sexual health, most discussed HIV or other STDs (92.3%), or how to have safe sex or use condoms (85.0%). There were no significant correlations between discussion of HIV or other STDs and any of the independent variables. Receiving education from a doctor related to safe sex or condom use was higher among respondents with a college degree compared to any other education group (*p*≤.05), among Black respondents compared to those of other races (*p*≤.05), and among respondents who had had sex compared to those who had not (87.3% vs. 76.6%, *p*≤.001).

Just over half of those who talked with their doctors about sex discussed abstinence (56.1%). Discussion with a doctor regarding abstinence was significantly higher among females compared to males (63.5% vs.46.6%, *p*≤.001) and among respondents born in the United States compared to those born in another country (57.6% vs. 40.5%, *p*≤.05).

Predictors.

Discussing any sex education topic with a doctor (see Tables 26-27) was more likely for females compared to males (OR=1.52, 95% CI [1.18, 1.96]); for those with Medicaid, CHIP, or state-sponsored insurance (OR=1.44, 95% CI [1.07, 1.93]) or with a single-service plan or no health insurance (OR=1.68, 95% CI [1.19, 2.38]) compared to those with private health insurance; and for Black compared to White respondents (OR=1.62, 95% CI [1.24, 2.11]). Speaking with a doctor about a sex education topic was less likely among respondents who had no source of health care compared to those who visited a private doctor's office (OR=0.60, 95% CI [0.47, 0.77]), among those who were married compared to single (OR=0.55, 95% CI [0.35, 0.88]), and among those who had no sexual experience compared to those who did (OR=0.38, 95% CI [0.30, 0.49]).

Among those whose doctor was a source of sex education, discussion of HIV or other STDs was more likely for those who attended religious services at age 14 once per month to once per week compared to those who attended once per week or more (OR=2.27, 95% CI [1.04, 4.92]). It was less likely for those who received health care at a clinic compared to those who visited a private doctor's office (OR=0.46, 95% CI [0.21, 0.98]) and for those who had not had sex compared to those who had (OR=0.47, 95% CI [0.24, 0.95]). Discussion with a doctor about safe sex or condom use was more likely for college graduates compared to those with less than a high school education (OR=4.45, 95% CI [1.66, 11.94]). It was less likely for those who had never had sex compared to those with sexual experience (OR=0.49, 95% CI [0.30, 0.81]). For those who spoke with their doctor about a sex education topic, talking about abstinence was more likely to occur for females compared to males (OR=2.14, 95% CI [1.46, 3.13]).

Discussion

The purpose of this research was to assess the association of elements of social location with sources of sex education and exposure to specific sex education topics among teens and young adults in the United States. We found several key predictors across these areas of interest; Specifically, we find health care access (as measured by health insurance status and access to a health care provider), sex, education, race, religion, and sexual experience to be consistently significant predictors of what and from whom young people learn about sex.

We found lack of health care access to be a significant barrier to access to all sources of sex education included in this analysis. Compared to those who access health care services at a private doctor's office, those who had no source of health care have significantly lower odds of getting health information from any source; not only from a doctor, but also from a formal source such as a school, church, or community center, and from parents as well. A lack of health care access is associated with lower access to information from a formal source about birth control and how to say no to sex, and from parents about STDs, how to prevent HIV/AIDs, and where to get birth control. Interestingly, having Medicaid or no insurance is associated with higher use of doctors as a source of health information compared to those who had private health insurance; Since the sources of health information in this study are not necessarily mutually exclusive, this could possibly reflect access to the services of doctors who work in non-profit community-based health care clinics or service organizations.

This study supports the findings of others that females are more likely to discuss sex education with their parents (Byers, Sears, &Weaver, 2008; Hutchinson, 2002; Cosby & Miller, 2002). Our findings show females to be especially likely to have talked with parents about how to say no to sex, and to a lesser degree about STDS and about methods of birth control and where to get it. One exception to this trend is that males are more likely to talk with their parents about how to use a condom; Males are also more likely to have talked with a formal source about condom use. Females have higher odds of talking about any sex education topic with a doctor, but they are significantly higher for discussing abstinence. It is noteworthy that female sex is the only predictor of talking with a doctor about abstinence; Taken together with the significance of female sex for talking with parents about abstinence, this study provides an example of a social norm in which females are expected to remain sexually inexperienced until marriage – or at least well into adulthood - while males are expected to accumulate sexual experience: "boys will be boys," after all. A detailed exposé on this double standard is beyond the scope of this paper, but Fahs (2010) cautions that a prevailing social focus on abstinence in women can leave them sexually unprepared and vulnerable to uninformed sexual decisions and behaviors.

In our regression models, the education variable served as a stand-in for age and occupation as well, all of which were highly correlated for this age group. In this analysis, higher education / age is associated with higher use of formal sources but lower use of parents and doctors as sources of sex education. Higher education / age is also associated with discussing birth control with each source, while lower education / age is associated with learning about STDs and HIV/AIDS from parents and doctors. For information about condom use, those with higher education / age are more likely to learn from formal sources and doctors, while those with lower education / age are more likely to learn from parents. Many youth who are still in high school and living at home likely have more access to their parents than other sources of information, while older youth and young adults might have access to more resources. Discussion of STDs and HIV/AIDS in younger age groups may reflect preventive messages from parents and doctors, while discussion of birth control in older age groups may reflect higher levels of sexual activity.

In this study, use of a formal source of health education was not predicted by race, but learning from a formal source about how to prevent HIV/AIDS wass higher for respondents of "Other" race compared to White. "Other" race respondents were less likely than White respondents to talk with their parents about sex, especially about where to obtain birth control. Black race was significantly associated with several topics discussed with parents. Compared to White respondents, Black respondents were more likely to talk with their parents about how to prevent HIV/AIDS and how to use a condom, and less likely to talk with them about how to say no to sex or about birth control. This may reflect cultural perceptions about the desirability of pregnancy as well as an awareness of a higher prevalence of STDs among Black youth compared to youth of other races (Bueno, 2013; CDC, 2014; Winters & Winters, 2012). Black respondents were more likely to get sex education from a doctor, from whom they are also more likely to learn about safe sex or condom use.

Religious affiliation and religious attendance while growing up both predicted exposure to abstinence-based messages – how to say no to sex and waiting until marriage to have sex. Our findings support those of Farringdon, Holgate, McIntyre, &

Bulsara (2014), who found religious parents to be less comfortable talking with their children about certain topics related to safe sex and birth control. We found that respondents with high religious attendance at age 14 have significantly higher odds of talking with their parents about a sex education topic. However, compared to respondents who were raised with no religion, those raised in religious households were more likely to talk with their parents about risk avoidance – how to say no to sex – and less likely to discuss risk reduction strategies like how to prevent HIV/AIDS and where to obtain birth control. The highest frequency of religious attendance was also associated with higher odds of talking with parents about how to say no to sex, as was being raised in a Protestant or "Other" religious affiliation compared to no religious affiliation. More frequent religious attendance increased the odds of exposure to messages from a formal source about waiting until marriage to have sex, but religious affiliation did not have the same effect. While this could suggest that these messages may be coming from religious organizations and not necessarily from schools, it is also possible that the association between more frequent religious attendance and exposure to abstinence-based messages reflects a prevailing cultural correlation (Bleakley, Hennessy, and Fishbein, 2010; Heller & Johnson, 2013). Religion was not associated with receiving messages about abstinence or any other specific topic from a doctor.

As one might expect, sexual experience was very significantly associated with many measures of access to sex education. Compared to respondents who had had sex with any partner, respondents who reported never having had sex had significantly lower odds of talking with their parents about sex, as well as discussing any particular sex education topic with the exception of how to say no to sex, for which they had higher odds. Respondents without sexual experience were less likely to talk with a doctor about any sex topic, but especially safe sex or condom use; they were also less likely to learn from a formal source about STDs, how to prevent HIV/AIDS, condom use, and where to get birth control. While it seems logical that youth with sexual experience would be more likely to have received more sex education, the fact that those without sexual experience so consistently have less sex education is cause for concern. Sex education can impact a number of sexual behaviors that have long-term impacts, including age at first sex, use of contraception, use of sexual health services, and likelihood of engaging in unsafe sexual practices (Bourke, Boduszek, Kelleher, McBride, & Morgan, 2014; Dehlendorf, Rodriguez, Levy, Borrero, & Steinauer, 2010; Doskoch, 2012b; Kohler, Manhart, & Lafferty, 2008; Kubicek, Beyer, Weiss, Iverson, & Kipke, 2010; Lindberg & Maddow-Zimet, 2012; Secor-Turner, Sieving, Eisenberg, & Skay, 2011). Whether youth are currently sexually experienced or not, preparation for possible future sexual activity would likely play a protective role in their long-term health outcomes.

Limitations

There were several limitations to this study. First, sex education from additional sources of health information such as friends, peers, the Internet, or other digital media have been found to influence knowledge, attitudes, and self-efficacy related to sex (Guse et al., 2012), but they were not included in measures of access to sex education in this survey. The unavailability of these sources in this national survey constrains the applicability of findings related to how people learn about sex; inclusion of these sources would provide a more comprehensive and informative understanding and enable more relevant insights into how people learn about sex in the United States. For example, in this study we found that lack of health care access is associated with lower access to parents, doctors, and formal sources of sex education. It would be beneficial to know whether young people with limited access to such resources are able to find sex education resources through other media. We also found that females are more likely than males to talk with parents and doctors about sex. Additional options could inform us if males in this population are more likely than females to turn to other sources for health information.

A second, similar limitation is related to the measurement of 'formal' sources of sex education: the grouping of churches, schools, community centers, and similar resources into one large category limits the interpretation of much of the 'formal source' data. For example, in this study we inferred that the association between more frequent religious attendance and learning about abstinence from a formal source reflects the influence of faith-based organizations as providers of sex education; with additional subcategories we could be more certain.

Third, this dataset was based on self-report data, which can lend itself to recall bias. Schroder, Carey, and Vanable (2003) note that responses in self-report of sexual health data can be biased by perceived question threat and perceived desirability of a behavior.

Additionally, the cross-sectional design of this study provided a time-based perspective on how social and cultural factors influence sex education; a replication of this study using data from previous waves of the National Survey of Family Growth would provide additional insight into trends over time in the factors influencing sex education in the United States.

Recommendations

As the most universally-reported source of sex education, institutions such as schools, faith-based organizations, and community-based organizations reach the overwhelming majority of young people with messages about sex and sexual health. Community-based organizations can be a valuable sex education resource for youth. They may be able to fill in information gaps by covering topical areas not addressed by other formal sources of sex education (Fisher, Reece, Wright, Dodge, Sherwood-Laughlin, & Baldwin, 2012). As such, it may be beneficial for personnel employed by or volunteering with such youth-serving organizations to be well-prepared to educate and counsel young people about sex and sexual health or to know where to refer them.

The recently-developed National Teacher-Preparation Standards for Sexuality Education represent an effort to empower teachers to be effective sex educators in a school-based setting (Barr, Goldfarb, Russell, Seabert, Wallen, & Wilson, 2014), but the guidance they provide may be beneficial for educators in other formal settings as well.

The standards are:

- Professional disposition: Demonstrate comfort with, commitment to and self-efficacy in teaching sexuality education;
- Diversity and equity: Show respect for individual, family and cultural characteristics and experiences that may influence student learning about sexuality;
- Content knowledge: Have accurate knowledge of the biological, emotional and social aspects of human sexuality and the laws relating to sexuality and youth;
- Legal and professional ethics: Make decisions based on applicable federal, state and local laws, regulations and policies as well as professional ethics;
- Planning: Plan developmentally and age- and developmentally-appropriate sexuality education that is aligned with standards, policies and laws and reflects the diversity of the community;
- Implementation: Use a variety of effective strategies to teach sexuality education;
- Assessment: Implement effective strategies to assess student knowledge, attitudes and skills in order to improve sexuality education instruction.

Parents play a critical role in providing sex education to young people (Nielsen, Latty, & Angera, 2013). Sex education from parents can help teens develop sexual agency and establish safe sexual practices (Crosby, Hanson, & Rager, 2009), and parents can be an effective source of sexual health information for minority and high-risk youth (Sutton, Lasswell, Lanier, & Miller, 2014). Parents who are uncomfortable with or unknowledgeable about sexual health topics can seek out education for themselves in order to provide better information and support for their children (Farringdon, Holgate, McIntyre, & Bulsara, 2014); Resources such as the *Parents Speak Up National Campaign* can provide effective tools in increasing parent-child communication about sex (Davis, Evans, & Kamyab, 2013). Parents can also play a role in influencing the sex education provided to youth in the school setting by sharing their views with teachers, administrators, and school boards (Eisenberg, Bernat, Bearinger, & Resnick, 2008).

As exposure to sexual medical courses and communication skills training has been associated with increased likelihood of health care providers addressing sexual health with their patients (Tsimtsiou, Hatzimouratidis, Nakopoulou, Kyrana, Salpigidis, & Hatzichristou, 2006), it may be beneficial for medical residency programs to offer such options so that health care providers can competently address the sexual health needs and concerns of future patents (Coleman et al., 2013; Criniti, Andelloux, Woodland, Montgomery, & Hartmann, 2014; Gill & Hough, 2007). Another option for health care providers is to partner with sexuality educators for patient referral (Davis, 2011).

Perhaps one of the most common-sense recommendations related to providing sex education from any source to young people is to include them as a key partner in its development (Kuriansky & Corsini-Munt, 2009). Common critiques of youth-directed sex education are that it is too clinical and technical, that it covers too narrow a range of topics, that its treatment of sex is too negative, and that its general directive to youth to not have sex is unrealistic. Youth may get more out of and respond more positively to sex education that covers topics such as how to make sex enjoyable, sex and sexuality in the context of relationships, inclusion of a broad spectrum of sexual behaviors and options, and how to access health services; comes from a trusted and trustworthy source; and that is direct, realistic and pragmatic in its approach (Allen, 2008; Angulo-Olaiz, Goldfarb, & Constantine, 2014; Gardner, 2015; Kimmel et al., 2013; Moore, Berkley-Patton, Bohn, Hawes, & Bowe-Thompson, 2014). Ultimately, youth desire sex education that acknowledges their own personal agency and sexuality, and that empowers them to make informed choices for themselves. Additional topics which are not typically included in sex education programs but would enhance the ability of youth to make informed decisions are gender identity and identity development (Boskey, 2014), sexual orientation and non-reproductive expressions of sexuality (Elia & Eliason, 2010; Flores, 2014; Hillier & Mitchell, 2008; Pingel, Thomas, Harmell, & Bauermeister, 2013), the positive aspects of pleasure (deFur, 2012; Lamb, Lustig, & Graling, 2013), and sexuality in the context of mental health issues and disabilities (Higgins, Barker, & Begley, 2006; Holmes & Himle, 2014; Minch, 2013).

Finally, a general recommendation for the creation of any sexual health education is to use health literate approaches in the development of materials to be used with any information source. Publicly available resources such as the Health Literacy Universal Precautions Toolkit (AHRQ, 2010) and the CDC Clear Communication Index (Centers for Disease Control and Prevention, 2014) can assist in the creation, design, and evaluation of sexual health messages.

Conclusion

Many aspects of social location affect what and from whom young people learn about sex, sexuality, and sexual health. Our study of a national sample of teens and young adults found that health care access, sex, education, race, religion, and sexual experience are consequential factors in exposure to sex education resources and information. Access to sexual health information was lower for those with limited health care access, and exposure to particular sex education messages varied significantly. The results of this study can be used by youth workers, families, and policy makers to inform the development of effective approaches to sex education for America's youth.

Tables

Table 9 - Descriptive Data (N=3895; Weighted N=40,279,208)

Variable	%
Age	n=3895
15-17 years old	28.3%
18-21 years old	40.8%
22-24 years old	30.9%
Sex	n=3895
Female	49.2%
Male	50.8%
Self-Rated Health	n=3887
Excellent	34.2%
Very Good	39.9%
Good, Fair or Poor	25.9%
Education	n=3895
Less than High School	38.3%
High School Graduate	27.9%
Some College	24.8%
College Degree	9.0%
Occupation	n=3895
Employed	52.8%
Unemployed	7.9%
In School	25.9%
Other	13.3%
Annual Family Income	n=3895
Less than $35,000	51.3%
$35,000 or more	48.7%
Health Insurance Status	n=3895
Private	51.5%
Medicaid	22.0%
Medicare	6.6%
Not Covered	19.9%
Health Care Provider	n=3838
Private doctor's office	47.9%
Clinic	18.6%
Hospital or Urgent Care	9.0%
None	24.5%
Place of Residence	n=3895
Principal City of MSA	33.9%
Other MSA	50.4%
Not MSA	15.8%
Ethnicity	n=3895
Hispanic	21.8%
Non-Hispanic	78.2%

Variable (*cont'd*)	%
Race	n=3895
White	68.5%
Black	17.1%
Other	14.4%
Nativity	n=3894
Born Outside of US	9.5%
US Native	90.5%
Primary Language (spoken at home)	n=3895
English	89.6%
Spanish	7.6%
Other	2.8%
Relationship Status	n=3859
Married	6.0%
Living with a Partner	12.2%
Single	81.8%
Family Background	n=3895
Two Biological/Adoptive Parents	53.2%
Any Other Family Structure	46.8%
Current Religion	n=3895
No Religion	22.7%
Catholic	22.7%
Protestant	45.6%
Other	9.1%
Religion Raised	n=3885
No Religion	12.5%
Catholic	29.7%
Protestant	48.1%
Other	9.7%
Religious Attendance at age 14	n=3887
Once/week or more	50.2%
Once/month to Once/week	16.0%
Less than Once/month	16.2%
Never	17.7%
Sexual Orientation	n=3857
Heterosexual or Straight	92.9%
Gay, Lesbian or Bisexual	7.1%
Sexual Experience	n=3889
Has had sex with any partner	68.4%
Has not had sex	31.6%

Table 10 - Sex Education from a Formal Source and Topics Covered

Variables	Formal Source	STDs	HIV/AIDS	No to sex	Marriage	Birth control	Condoms	Where to get
Total	97.3%	92.5%	88.6%	83.6%	75.6%	65.4%	60.4%	51.7%
Age						***	***	***
15-17 years old	97.9%	92.8%	87.5%	84.6%	76.8%	52.2%	50.5%	41.1%
18-21 years old	97.5%	92.7%	87.9%	84.9%	74.1%	70.4%	63.2%	53.7%
22-24 years old	96.7%	92.1%	90.4%	81.1%	76.5%	71.1%	65.6%	59.1%
Sex					*	*	*	***
Female	97.1%	93.2%	88.6%	84.2%	78.0%	68.3%	57.2%	58.9%
Male	97.5%	91.9%	88.6%	83.1%	73.2%	62.7%	63.3%	44.8%
Self-Rated Health								
Excellent	96.6%	92.0%	89.3%	84.7%	75.3%	64.6%	59.2%	49.3%
Very Good	98.1%	94.3%	89.8%	84.8%	76.1%	67.9%	62.1%	51.0%
Good, Fair, or Poor	97.1%	91.4%	86.5%	81.7%	76.3%	63.5%	59.0%	56.7%
Education	*					***	***	***
Less than High School	97.1%	91.5%	86.7%	83.3%	75.6%	54.1%	52.1%	42.7%
High School Graduate	96.2%	91.4%	88.9%	82.8%	72.9%	68.2%	64.8%	54.8%
Some College	98.4%	94.4%	89.8%	84.5%	77.4%	74.5%	66.5%	58.7%
College Degree	99.0%	95.3%	92.2%	85.2%	78.8%	79.4%	64.5%	61.0%
Occupation						**	*	*
Employed	98.1%	93.2%	89.1%	84.1%	75.0%	67.9%	62.7%	54.1%
Unemployed	94.0%	93.7%	88.9%	86.3%	75.4%	70.7%	62.0%	53.1%
In School	97.1%	91.4%	88.3%	83.4%	76.4%	58.7%	54.1%	45.1%
Other	96.6%	91.2%	86.9%	80.6%	76.4%	65.5%	62.4%	54.1%
Annual Family Income	**	*	*	*			*	
Less than $35,000	96.1%	91.2%	86.6%	81.5%	73.7%	63.7%	58.0%	51.4%
$35,000 or more	98.7%	93.9%	90.6%	85.9%	77.5%	67.1%	62.7%	52%
Health Insurance Status			*	*	**	***		
Private	97.9%	93.6%	90.4%	86.2%	78.7%	70.2%	60.3%	51.3%
Medicaid	95.7%	91.8%	87.5%	79.0%	70.9%	56.8%	60.4%	51.8%
Medicare	98.1%	92.9%	87.6%	82.8%	73.5%	61.0%	65.1%	49.3%
Not Covered	97.4%	90.4%	85.2%	82.5%	73.3%	63.9%	58.9%	53.5%

Note: * p≤0.05; **p≤0.01; *** p≤0.001

Table 11 - Sex Education from a Formal Source and Topics Covered (cont'd)

Variables	Formal Source	STDs	HIV/AIDS	No to sex	Marriage	Birth control	Condoms	Where to get
Health Care Provider	*			***	*			
Private doctor's office	98.6%	93.5%	90.0%	87.9%	79.2%	67.4%	59.9%	53.1%
Clinic	96.5%	94.0%	90.3%	79.7%	71.2%	67.5%	64.4%	51.3%
Hospital or Urgent Care	96.9%	87.1%	84.0%	76.0%	69.6%	58.6%	59.3%	47.0%
None	95.7%	91.8%	86.3%	80.8%	73.5%	62.6%	58.2%	50.7%
Place of Residence			***				*	*
Principal City of MSA	97.2%	92.4%	90.0%	83.6%	74.4%	68.4%	65.1%	56.2%
Other MSA	98.0%	93.7%	89.8%	84.6%	77.6%	65.5%	58.3%	51.4%
Not MSA	95.6%	89.1%	81.6%	80.6%	71.7%	58.5%	56.5%	42.8%
Ethnicity				*	***			
Hispanic	97.4%	92.4%	89.1%	80.0%	67.8%	66.7%	64.9%	54.5%
Non-Hispanic	97.3%	92.6%	88.4%	84.7%	77.7%	65.1%	59.1%	51.0%
Race					*			
White	97.5%	92.7%	88.1%	84.7%	75.5%	67.4%	58.9%	51.3%
Black	96.9%	94.2%	89.1%	81.5%	81.7%	62.6%	63.8%	54.4%
Other	97.3%	89.7%	90.4%	81.4%	68.5%	59.4%	63.3%	50.5%
Nativity					*	*		
Born Outside of US	97.7%	91.6%	91.9%	82.1%	68.3%	71.3%	64.8%	54.5%
US Native	97.3%	92.6%	88.2%	83.8%	76.4%	64.8%	59.9%	51.4%
Primary Language (spoken at home)				*	***			
English	97.2%	92.9%	88.5%	84.5%	77.3%	65.6%	59.9%	51.8%
Spanish	97.9%	93.6%	90.9%	80.9%	63.1%	67.5%	67.3%	55.1%
Other	99.0%	78.9%	83.8%	63.7%	55.1%	53.4%	54.5%	38.3%
Relationship Status	*					***		***
Married	96.1%	90.1%	88.2%	81.3%	73.1%	72.3%	60.9%	54.3%
Living with a Partner	95.9%	92.1%	88.6%	82.2%	74.9%	73.2%	65.7%	61.3%
Single	97.7%	92.8%	88.6%	84.0%	75.9%	63.7%	59.5%	50.1%
Family Background								
Two Biological/Adoptive Parents	98.1%	91.4%	88.4%	84.6%	76.4%	66.0%	59.3%	51.6%
Any Other Family Structure	96.5%	93.8%	88.8%	82.6%	74.6%	64.8%	61.6%	51.9%

Note: * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Table 12 - Sex Education from a Formal Source and Topics Covered (cont'd)

Variables	Formal Source	STDs	HIV/AIDS	No to sex	Marriage	Birth control	Condoms	Where to get
Current Religion					***			
No Religion	96.2%	94.3%	87.7%	81.3%	64.6%	68.0%	64.1%	52.4%
Catholic	98.5%	92.5%	91.1%	85.1%	74.6%	68.8%	61.4%	55.1%
Protestant	97.3%	92.6%	87.9%	84.1%	81.6%	63.4%	58.6%	49.6%
Other	97.3%	88.2%	88.2%	83.8%	75.0%	60.7%	57.6%	52.3%
Religion Raised					***			
No Religion	95.6%	93.2%	87.0%	79.4%	63.0%	64.0%	58.0%	45.8%
Catholic	98.2%	93.0%	91.0%	84.6%	73.1%	66.8%	62.8%	54.7%
Protestant	97.2%	93.0%	87.7%	84.3%	80.8%	65.8%	59.4%	50.6%
Other	97.6%	88.1%	87.2%	82.6%	72.9%	61.3%	60.3%	55.4%
Religious Attendance at 14					***			
Once/week or more	97.7%	92.0%	87.6%	85.8%	84.3%	63.4%	58.8%	50.5%
Once/month to Once/week	97.8%	94.4%	88.7%	81.6%	71.2%	68.9%	63.3%	52.9%
Less than Once/month	97.2%	91.6%	90.3%	82.9%	67.2%	65.8%	63.0%	53.7%
Never	96.0%	93.5%	89.8%	79.9%	62.1%	67.9%	59.7%	52.4%
Sexual Orientation					***			*
Straight	97.5%	92.6%	88.9%	84.4%	76.6%	65.5%	60.1%	51.2%
Gay, Lesbian or Bisexual	97.4%	95.6%	88.9%	78.6%	64.7%	66.7%	63.4%	61.0%
Sexual Experience		**	**			***	***	***
Has had sex with any partner	97.0%	94.1%	90.3%	82.8%	74.7%	68.7%	66.9%	57.0%
Has not had sex	98.1%	89.2%	85.0%	85.7%	77.7%	58.7%	46.6%	40.7%

Note: * p≤0.05; **p≤0.01; *** p≤0.001

Table 13 - Regression Analysis of Sex Education from a Formal Source and Topics Covered: Odds Ratios and 95% Confidence Intervals

	Formal - Any Topic		STDs		How to Prevent HIV/AIDS		How to Say No to Sex	
Variables	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Intercept	25.00	[4.39, 142.57]	10.44	[3.93, 27.72]	7.10	[3.15, 16.04]	7.63	[4.20, 13.87]
Sex								
Female	0.86	[0.50, 1.46]	1.25	[0.82, 1.90]	1.03	[0.77, 1.38]	1.02	[0.77, 1.34]
Male	1.00		1.00		1.00		1.00	
Self-Rated Health								
Good, Fair, Poor	1.85*	[1.00, 3.43]	0.92	[0.59, 1.46]	0.75	[0.53, 1.05]	0.84	[0.62, 1.15]
Very Good	1.99*	[1.00, 3.94]	1.43	[0.88, 2.32]	0.99	[0.69, 1.40]	1.03	[0.76, 1.38]
Excellent	1.00		1.00		1.00		1.00	
Education								
College Degree	3.14*	[1.03, 9.58]	1.58	[0.72, 3.46]	1.30	[0.76, 2.23]	0.90	[0.56, 1.44]
Some College	2.09	[0.85, 5.15]	1.20	[0.68, 2.13]	1.06	[0.73, 1.54]	0.97	[0.69, 1.35]
High School Graduate	1.05	[0.51, 2.16]	0.85	[0.52, 1.38]	1.19	[0.84, 1.69]	1.01	[0.72, 1.41]
Less than High School	1.00		1.00		1.00		1.00	
Annual Family Income								
$35K or more	2.24	[0.91, 5.54]	1.40	[0.88, 2.23]	1.30	[0.92, 1.84]	1.11	[0.85, 1.44]
Less than $35K	1.00		1.00		1.00		1.00	
Health Insurance Status								
Not Covered	2.37	[0.90, 6.23]	0.76	[0.46, 1.26]	0.67	[0.44, 1.02]	1.25	[0.80, 1.94]
Medicare	2.47	[0.61, 10.04]	0.92	[0.38, 2.23]	0.71	[0.41, 1.23]	1.03	[0.63, 1.68]
Medicaid	1.29	[0.55, 3.02]	0.86	[0.42, 1.78]	0.81	[0.50, 1.31]	0.88	[0.62, 1.26]
Private	1.00		1.00		1.00		1.00	
Health Care Provider								
None	0.31**	[0.14, 0.69]	0.81	[0.47, 1.41]	0.68	[0.44, 1.06]	0.58***	[0.44, 0.75]
Hospital or Urgent Care	0.43	[0.16, 1.15]	0.61	[0.27, 1.37]	0.73	[0.37, 1.42]	0.47***	[0.29, 0.76]
Clinic	0.48	[0.20, 1.14]	1.20	[0.68, 2.12]	1.09	[0.71, 1.66]	0.58***	[0.43, 0.78]
Private doctor's office	1.00		1.00		1.00		1.00	
Place of Residence								
Not MSA	0.73	[0.30, 1.80]	0.90	[0.51, 1.58]	0.55*	[0.34, 0.88]	0.81	[0.52, 1.26]
Other MSA	1.21	[0.48, 3.02]	1.29	[0.84, 1.97]	0.97	[0.71, 1.32]	0.90	[0.67, 1.20]
Principal City of MSA	1.00		1.00		1.00		1.00	

*Note: An OR of 1.00 =referent group; * p≤0.05; **p≤0.01; *** p≤0.001

Table 14 - Regression Analysis of Sex Education from a Formal Source and Topics Covered: Odds Ratios and 95% Confidence Intervals (cont'd)

	Formal -Any Topic		STDs		How to Prevent HIV/AIDS		How to Say No to Sex	
Variables	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Ethnicity								
Hispanic	0.89	[0.38, 2.05]	1.09	[0.56, 2.13]	0.95	[0.61, 1.49]	0.70	[0.46, 1.05]
Non-Hispanic	1.00		1.00		1.00		1.00	
Race								
Other	1.49	[0.69, 3.19]	1.04	[0.53, 2.03]	1.95**	[1.20, 3.19]	1.02	[0.60, 1.74]
Black	1.14	[0.41, 3.18]	1.34	[0.74, 2.42]	1.20	[0.75, 1.90]	0.82	[0.60, 1.11]
White	1.00		1.00		1.00		1.00	
Nativity								
Born Outside of US	0.87	[0.33, 2.29]	1.19	[0.66, 2.15]	1.43	[0.79, 2.60]	0.96	[0.63, 1.45]
US Native	1.00		1.00		1.00		1.00	
Relationship Status								
Married	0.40*	[0.17, 0.94]	0.43	[0.17, 1.10]	0.73	[0.43, 1.25]	0.78	[0.40, 1.52]
Living with a Partner	0.47*	[0.24, 0.90]	0.91	[0.47, 1.77]	1.17	[0.74, 1.84]	1.09	[0.68, 1.76]
Single	1.00		1.00		1.00		1.00	
Family Background								
Any Other Family Structure	0.57	[0.29, 1.11]	1.71**	[1.19, 2.46]	1.27	[0.94, 1.72]	1.04	[0.84, 1.30]
Two Biological/Adoptive Parents	1.00		1.00		1.00		1.00	
Religion Raised								
Other	2.54	[0.61, 10.54]	0.67	[0.31, 1.46]	1.19	[0.64, 2.23]	1.29	[0.68, 2.44]
Protestant	1.14	[0.47, 2.77]	0.87	[0.44, 1.73]	1.18	[0.74, 1.87]	1.22	[0.79, 1.90]
Catholic	1.84	[0.89, 3.82]	0.87	[0.44, 1.73]	1.48	[0.89, 2.47]	1.42	[0.95, 2.11]
No Religion	1.00		1.00		1.00		1.00	
Religious Attendance at 14								
Never	0.83	[0.46, 1.52]	1.40	[0.82, 2.39]	1.53*	[1.03, 2.27]	0.78	[0.54, 1.13]
Less than Once/month	1.23	[0.58, 2.63]	0.96	[0.52, 1.80]	1.37	[0.80, 2.37]	0.83	[0.58, 1.19]
Once/month to Once/week	1.11	[0.57, 2.18]	2.18**	[1.23, 3.88]	1.35	[0.93, 1.95]	0.84	[0.61, 1.17]
Once/week or more	1.00		1.00		1.00		1.00	
Sexual Orientation								
Gay, Lesbian or Bisexual	1.10	[0.45, 2.66]	1.44	[0.71, 2.92]	0.95	[0.57, 1.60]	0.73	[0.45, 1.17]
Straight	1.00		1.00		1.00		1.00	
Sexual Experience								
Has not had sex	1.34	[0.76, 2.36]	0.42***	[0.25, 0.71]	0.57***	[0.41, 0.78]	1.17	[0.81, 1.69]
Has had sex with any partner	1.00		1.00		1.00		1.00	
% Correctly Classified	*97.5%*		*92.9%*		*88.9%*		*84.0%*	

*Note: An OR of 1.00 =referent group; * p≤0.05; **p≤0.01; *** p≤0.001

Table 15 - Regression Analysis of Sex Education from a Formal Source and Topics Covered: Odds Ratios and 95% Confidence Intervals

	Waiting Until Marriage		Methods of Birth Control		How to Use a Condom		Where to get Birth Control	
Variables	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Intercept	4.43	[2.12, 9.27]	1.10	[0.73, 1.67]	1.50	[0.90, 2.48]	0.44	[0.25, 0.78]
Sex								
Female	1.25	[0.98, 1.59]	1.21	[0.95, 1.54]	0.77*	[0.62, 0.95]	1.76***	[1.43, 2.16]
Male	1.00		1.00		1.00		1.00	
Self-Rated Health								
Good, Fair, Poor	1.20	[0.92, 1.58]	0.99	[0.79, 1.25]	1.01	[0.79, 1.31]	1.25	[0.98, 1.60]
Very Good	1.12	[0.85, 1.47]	1.13	[0.90, 1.41]	1.16	[0.91, 1.46]	1.03	[0.82, 1.28]
Excellent	1.00		1.00		1.00		1.00	
Education								
College Degree	0.93	[0.61, 1.41]	2.65***	[1.72, 4.08]	1.38	[0.90, 2.13]	1.73**	[1.16, 2.60]
Some College	0.94	[0.75, 1.17]	2.24***	[1.77, 2.83]	1.54**	[1.14, 2.09]	1.69***	[1.26, 2.26]
High School Graduate	0.90	[0.64, 1.27]	1.78***	[1.36, 2.33]	1.41*	[1.07, 1.86]	1.48***	[1.15, 1.90]
Less than High School	1.00		1.00		1.00		1.00	
Annual Family Income								
$35K or more	1.05	[0.79, 1.41]	0.96	[0.78, 1.19]	1.29**	[1.07, 1.55]	1.07	[0.88, 1.30]
Less than $35K	1.00		1.00		1.00		1.00	
Health Insurance Status								
Not Covered	1.01	[0.73, 1.42]	0.74	[0.55, 1.01]	0.89	[0.68, 1.17]	1.14	[0.86, 1.50]
Medicare	0.93	[0.63, 1.35]	0.56**	[0.38, 0.84]	1.24	[0.82, 1.89]	1.00	[0.74, 1.36]
Medicaid	0.82	[0.61, 1.11]	0.63***	[0.46, 0.85]	1.05	[0.81, 1.36]	1.16	[0.88, 1.53]
Private	1.00		1.00		1.00		1.00	
Health Care Provider								
None	0.88	[0.68, 1.15]	0.77*	[0.59, 0.99]	0.75*	[0.59, 0.95]	0.82	[0.64, 1.05]
Hospital or Urgent Care	0.75	[0.45, 1.24]	0.83	[0.58, 1.20]	0.83	[0.61, 1.14]	0.84	[0.57, 1.23]
Clinic	0.84	[0.63, 1.13]	1.14	[0.85, 1.54]	1.06	[0.83, 1.35]	0.94	[0.70, 1.25]
Private doctor's office	1.00		1.00		1.00		1.00	
Place of Residence								
Not MSA	0.96	[0.69, 1.34]	0.75	[0.52, 1.10]	0.78	[0.54, 1.11]	0.66*	[0.43, 0.99]
Other MSA	1.14	[0.86, 1.51]	0.93	[0.75, 1.15]	0.81	[0.62, 1.05]	0.93	[0.75, 1.16]
Principal City of MSA	1.00		1.00		1.00		1.00	

*Note: An OR of 1.00 =referent group; * p≤0.05; **p≤0.01; *** p≤0.001

Table 16 - Regression Analysis of Sex Education from a Formal Source and Topics Covered: Odds Ratios and 95% Confidence Intervals (cont'd)

	Waiting Until Marriage		Methods of Birth Control		How to Use a Condom		Where to get Birth Control	
Variables	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Ethnicity								
Hispanic	0.68*	[0.50, 0.92]	1.19	[0.81, 1.75]	1.33	[0.98, 1.80]	1.06	[0.81, 1.39]
Non-Hispanic	1.00		1.00		1.00		1.00	
Race								
Other	0.87	[0.61, 1.26]	0.80	[0.57, 1.12]	1.24	[0.92, 1.68]	1.04	[0.76, 1.41]
Black	1.29	[0.92, 1.81]	0.92	[0.71, 1.20]	1.24	[0.92, 1.67]	1.14	[0.89, 1.45]
White	1.00		1.00		1.00		1.00	
Nativity								
Born Outside of US	0.75	[0.51, 1.11]	1.64**	[1.15, 2.35]	1.13	[0.85, 1.51]	1.16	[0.83, 1.64]
US Native	1.00		1.00		1.00		1.00	
Relationship Status								
Married	0.85	[0.53, 1.36]	1.10	[0.71, 1.71]	0.68	[0.44, 1.04]	0.76	[0.52, 1.11]
Living with a Partner	1.13	[0.80, 1.60]	1.45*	[1.07, 1.97]	1.00	[0.76, 1.33]	1.17	[0.89, 1.54]
Single	1.00		1.00		1.00		1.00	
Family Background								
Any Other Family Structure	0.98	[0.80, 1.21]	1.18	[0.94, 1.48]	1.11	[0.90, 1.37]	0.99	[0.83, 1.18]
Two Biological/Adoptive Parents	1.00		1.00		1.00		1.00	
Religion Raised								
Other	1.17	[0.65, 2.09]	0.99	[0.61, 1.61]	1.05	[0.71, 1.56]	1.81*	[1.05, 3.11]
Protestant	1.37	[0.95, 1.97]	1.13	[0.80, 1.60]	0.97	[0.73, 1.28]	1.32	[0.97, 1.81]
Catholic	1.20	[0.73, 1.95]	1.10	[0.75, 1.60]	1.02	[0.71, 1.47]	1.53*	[1.04, 2.25]
No Religion	1.00		1.00		1.00		1.00	
Religious Attendance at 14								
Never	0.35***	[0.25, 0.49]	1.37	[0.98, 1.93]	1.03	[0.79, 1.35]	1.33	[0.96, 1.82]
Less than Once/month	0.39***	[0.28, 0.55]	1.22	[0.87, 1.72]	1.14	[0.86, 1.51]	1.28	[0.92, 1.80]
Once/month to Once/week	0.50***	[0.38, 0.68]	1.54**	[1.12, 2.14]	1.18	[0.81, 1.73]	1.27	[0.98, 1.65]
Once/week or more	1.00		1.00		1.00		1.00	
Sexual Orientation								
Gay, Lesbian or Bisexual	0.52***	[0.38, 0.72]	0.93	[0.70, 1.24]	1.01	[0.66, 1.55]	1.08	[0.75, 1.57]
Straight	1.00		1.00		1.00		1.00	
Sexual Experience								
Has not had sex	1.03	[0.79, 1.35]	0.88	[0.67, 1.15]	0.47***	[0.37, 0.59]	0.61***	[0.49, 0.76]
Has had sex with any partner	1.00		1.00		1.00		1.00	
% Correctly Classified	*75.7%*		*67.0%*		*63.8%*		*62.0%*	

*Note: An OR of 1.00 =referent group; * p≤0.05; **p≤0.01; *** p≤0.001

Table 17 - Sex Education from Parents and Topics Covered

Variables	Parents	STDs	No to sex	Birth control	HIV/AIDS	Condoms	Where to get
Total	71.6%	71.6%	69.8%	61.1%	57.9%	56.5%	44.7%
Age	*			***		***	***
15-17 years old	76.5%	71.6%	71.6%	50.2%	55.9%	50.8%	37.0%
18-21 years old	69.8%	72.9%	69.7%	64.7%	59.0%	62.1%	48.2%
22-24 years old	69.7%	69.7%	68.1%	67.3%	58.6%	54.8%	47.8%
Sex	**		***	***		***	***
Female	75.1%	70.3%	79.4%	71.9%	57.0%	47.8%	55.1%
Male	68.3%	73.0%	59.6%	49.5%	59.0%	65.7%	33.7%
Self-Rated Health							
Excellent	73.6%	71.7%	73.3%	62.0%	58.6%	57.6%	44.8%
Very Good	71.6%	73.2%	69.5%	58.8%	57.4%	57.6%	42.2%
Good, Fair, or Poor	69.5%	68.7%	65.3%	63.6%	57.5%	53.4%	48.6%
Education			*	***		***	*
Less than High School	74.3%	72.7%	70.3%	52.4%	56.7%	54.3%	39.0%
High School Graduate	67.2%	73.0%	63.9%	64.7%	61.1%	64.3%	48.6%
Some College	72.0%	70.9%	72.5%	67.5%	59.3%	58.6%	50.6%
College Degree	73.2%	64.1%	76.9%	70.5%	50.7%	38.1%	42.0%
Occupation			**	***			
Employed	71.1%	71.9%	68.3%	65.3%	59.2%	55.9%	46.1%
Unemployed	66.8%	68.4%	58.3%	61.7%	56.8%	66.1%	44.6%
In School	73.8%	71.2%	74.0%	51.0%	54.1%	54.0%	39.6%
Other	72.7%	72.6%	73.7%	64.3%	61.2%	58.5%	49.4%
Annual Family Income							
Less than $35,000	71.4%	72.0%	70.1%	61.4%	58.8%	58.2%	46.4%
$35,000 or more	71.9%	71.1%	69.5%	60.7%	57.1%	54.7%	42.9%
Health Insurance Status	***					**	
Private	74.2%	72.0%	71.7%	62.3%	55.3%	52.4%	44.1%
Medicaid	72.8%	71.2%	68.7%	55.9%	61.9%	61.1%	47.0%
Medicare	71.3%	62.1%	65.8%	62.0%	51.6%	57.3%	41.9%
Not Covered	63.9%	74.3%	66.8%	63.7%	63.3%	62.6%	44.8%

Note: * $p \leq 0.05$; **$p \leq 0.01$; *** $p \leq 0.001$

Table 18 - Sex Education from Parents and Topics Covered (cont'd)

Variables	Parents	STDs	No to sex	Birth control	HIV/AIDS	Condoms	Where to get
Health Care Provider	***		**			***	*
Private doctor's office	75.9%	70.9%	74.4%	63.3%	58.4%	51.2%	48.7%
Clinic	70.4%	72.7%	67.8%	59.3%	57.0%	57.7%	41.4%
Hospital or Urgent Care	72.0%	76.4%	66.3%	58.5%	60.9%	62.4%	44.0%
None	63.7%	69.5%	61.6%	58.9%	55.7%	64.4%	38.4%
Place of Residence							
Principal City of MSA	73.7%	72.8%	69.4%	62.7%	59.3%	60.2%	46.9%
Other MSA	71.4%	72.6%	69.7%	59.5%	58.2%	55.3%	43.7%
Not MSA	68.3%	65.5%	71.2%	62.6%	53.9%	51.9%	43.2%
Ethnicity		*	***			*	
Hispanic	72.2%	76.9%	62.4%	56.8%	61.8%	61.6%	41.4%
Non-Hispanic	71.5%	70.1%	71.9%	62.3%	56.9%	55.0%	45.6%
Race	***		**	***	*	**	**
White	72.5%	71.2%	72.2%	65.2%	56.1%	54.6%	46.8%
Black	77.9%	75.4%	65.6%	53.6%	67.0%	67.7%	44.4%
Other	60.2%	68.0%	62.5%	49.1%	54.6%	50.2%	33.3%
Nativity	*			**			***
Born Outside of US	62.6%	71.5%	61.9%	49.1%	58.1%	57.2%	30.8%
US Native	72.6%	71.6%	70.5%	62.2%	57.9%	56.4%	46.0%
Primary Language (spoken at home)	***			***		*	***
English	72.4%	71.4%	70.6%	62.7%	57.8%	56.3%	46.4%
Spanish	73.1%	75.4%	61.0%	49.4%	59.8%	64.0%	33.2%
Other	43.9%	62.4%	66.0%	25.4%	59.6%	32.5%	7.5%
Relationship Status	*			***		*	**
Married	64.9%	66.1%	73.4%	73.8%	47.9%	53.0%	54.2%
Living with a Partner	66.8%	73.0%	63.4%	77.2%	62.5%	66.9%	55.0%
Single	73.2%	71.7%	70.4%	58.0%	58.0%	55.3%	42.6%
Family Background					*	***	**
Two Biological/Adoptive Parents	72.1%	69.7%	71.9%	58.8%	54.5%	51.7%	40.9%
Any Other Family Structure	71.2%	73.8%	67.3%	63.7%	61.9%	62.0%	49.1%

Note: * p≤0.05; **p≤0.01; *** p≤0.001

Table 19 - Sex Education from Parents and Topics Covered (cont'd)

Variables	Parents	STDs	No to sex	Birth control	HIV/AIDS	Condoms	Where to get
Current Religion	*		***	**		**	***
No Religion	67.0%	70.0%	64.7%	70.3%	59.3%	62.9%	55.2%
Catholic	73.3%	74.1%	61.0%	57.0%	56.5%	59.0%	40.5%
Protestant	74.0%	72.6%	75.0%	61.1%	58.0%	55.6%	44.0%
Other	67.0%	63.0%	77.7%	49.1%	58.2%	38.5%	33.5%
Religion Raised			***	*			*
No Religion	68.5%	67.7%	66.1%	67.2%	61.0%	58.2%	55.4%
Catholic	71.7%	72.6%	62.6%	58.8%	56.6%	59.4%	42.1%
Protestant	74.0%	72.7%	73.5%	62.9%	57.7%	56.5%	44.8%
Other	65.1%	66.5%	77.6%	50.1%	59.7%	44.5%	38.0%
Religious Attendance at 14	**		**				*
Once/week or more	74.9%	71.0%	74.0%	59.0%	56.5%	53.4%	40.7%
Once/month to Once/week	69.6%	77.3%	64.3%	60.8%	60.6%	60.4%	45.1%
Less than Once/month	71.5%	69.4%	65.2%	63.3%	61.7%	61.9%	52.0%
Never	64.9%	69.8%	65.8%	65.6%	56.3%	57.1%	49.8%
Sexual Orientation		*	*	**	**		***
Straight	72.0%	71.2%	69.2%	60.3%	57.2%	56.3%	43.5%
Gay, Lesbian or Bisexual	67.9%	80.8%	77.7%	73.9%	69.7%	63.2%	62.0%
Sexual Experience	**	**	**	***	***	***	***
Has had sex with any partner	73.8%	74.0%	66.9%	65.8%	61.4%	63.6%	49.5%
Has not had sex	67.0%	65.9%	76.6%	50.1%	49.7%	39.8%	33.4%

Note: * p≤0.05; **p≤0.01; *** p≤0.001

Table 20 - Regression Analysis of Sex Education from Parents and Topics Covered: Odds Ratios and 95% Confidence Intervals

	Parents – Any Topic		STDs		How to Say No to Sex	
Variables	OR	95% CI	OR	95% CI	OR	95% CI
Intercept	8.09	[4.48, 14.6]	3.14	[1.67, 5.92]	2.45	[1.29, 4.66]
Sex						
Female	1.40**	[1.09, 1.79]	0.91	[0.67, 1.23]	2.62***	[2.06, 3.35]
Male	1.00		1.00		1.00	
Self-Rated Health						
Good, Fair, Poor	0.85	[0.64, 1.13]	0.86	[0.62, 1.18]	0.62**	[0.42, 0.90]
Very Good	0.95	[0.71, 1.28]	1.07	[0.81, 1.42]	0.78	[0.55, 1.11]
Excellent	1.00		1.00		1.00	
Education						
College Degree	0.72	[0.46, 1.14]	0.56*	[0.33, 0.96]	1.29	[0.73, 2.28]
Some College	0.72	[0.52, 1.01]	0.75	[0.52, 1.08]	1.10	[0.75, 1.61]
High School Graduate	0.65***	[0.50, 0.83]	0.94	[0.68, 1.32]	0.83	[0.61, 1.13]
Less than High School	1.00		1.00		1.00	
Annual Family Income						
$35K or more	0.94	[0.75, 1.16]	0.98	[0.75, 1.27]	0.86	[0.66, 1.12]
Less than $35K	1.00		1.00		1.00	
Health Insurance Status						
Not Covered	0.77	[0.57, 1.04]	0.92	[0.64, 1.33]	1.25	[0.91, 1.72]
Medicare	1.21	[0.81, 1.81]	0.47*	[0.25, 0.87]	0.89	[0.52, 1.51]
Medicaid	0.93	[0.71, 1.21]	0.75	[0.53, 1.05]	1.13	[0.85, 1.51]
Private	1.00		1.00		1.00	
Health Care Provider						
None	0.60***	[0.44, 0.82]	0.85	[0.63, 1.16]	0.74	[0.51, 1.08]
Hospital or Urgent Care	1.02	[0.66, 1.58]	1.34	[0.93, 1.95]	0.89	[0.57, 1.40]
Clinic	0.75	[0.54, 1.03]	1.14	[0.80, 1.62]	0.98	[0.73, 1.30]
Private doctor's office	1.00		1.00		1.00	
Place of Residence						
Not MSA	0.92	[0.69, 1.22]	0.80	[0.55, 1.17]	1.06	[0.78, 1.44]
Other MSA	0.90	[0.72, 1.14]	1.11	[0.82, 1.49]	0.94	[0.70, 1.25]
Principal City of MSA	1.00		1.00		1.00	

*Note: An OR of 1.00 =referent group; * $p \leq 0.05$; **$p \leq 0.01$; *** $p \leq 0.001$

Table 21 - Regression Analysis of Sex Education from Parents and Topics Covered: Odds Ratios and 95% Confidence Intervals (cont'd)

	Parents – Any Topic		STDs		How to Say No to Sex	
Variables	OR	95% CI	OR	95% CI	OR	95% CI
Ethnicity						
Hispanic	1.31	[0.99, 1.73]	1.58**	[1.11, 2.23]	0.77	[0.56, 1.06]
Non-Hispanic	1.00		1.00		1.00	
Race						
Other	0.65**	[0.47, 0.89]	0.86	[0.60, 1.24]	0.67	[0.43, 1.04]
Black	1.23	[0.96, 1.58]	1.14	[0.75, 1.72]	0.62***	[0.45, 0.85]
White	1.00		1.00		1.00	
Nativity						
Born Outside of US	0.79	[0.54, 1.16]	0.95	[0.54, 1.66]	0.92	[0.60, 1.42]
US Native	1.00		1.00		1.00	
Relationship Status						
Married	0.54***	[0.38, 0.77]	0.82	[0.45, 1.51]	1.11	[0.72, 1.71]
Living with a Partner	0.69	[0.47, 1.01]	1.04	[0.69, 1.58]	0.67	[0.44, 1.03]
Single	1.00		1.00		1.00	
Family Background						
Any Other Family Structure	0.93	[0.73, 1.18]	1.20	[0.93, 1.55]	0.84	[0.61, 1.14]
Two Biological/Adoptive Parents	1.00		1.00		1.00	
Religion Raised						
Other	0.81	[0.48, 1.37]	0.99	[0.54, 1.80]	2.00*	[1.15, 3.48]
Protestant	0.92	[0.67, 1.25]	1.13	[0.73, 1.74]	1.43*	[1.02, 2.02]
Catholic	0.85	[0.55, 1.33]	1.00	[0.66, 1.51]	0.90	[0.59, 1.38]
No Religion	1.00		1.00		1.00	
Religious Attendance at 14						
Never	0.62***	[0.46, 0.85]	0.87	[0.60, 1.27]	0.79	[0.55, 1.14]
Less than Once/month	0.84	[0.61, 1.16]	0.91	[0.62, 1.35]	0.80	[0.59, 1.09]
Once/month to Once/week	0.81	[0.63, 1.04]	1.38	[0.96, 1.98]	0.70**	[0.54, 0.92]
Once/week or more	1.00		1.00		1.00	
Sexual Orientation						
Gay, Lesbian or Bisexual	0.73	[0.52, 1.01]	1.57	[0.97, 2.53]	1.46	[0.98, 2.18]
Straight	1.00		1.00		1.00	
Sexual Experience						
Has not had sex	0.48***	[0.38, 0.61]	0.61***	[0.45, 0.82]	1.40*	[1.00, 1.95]
Has had sex with any partner	1.00		1.00		1.00	
% Correctly Classified	*73.2%*		*71.3%*		*70.6%*	

*Note: An OR of 1.00 =referent group; * p≤0.05; **p≤0.01; *** p≤0.001

Table 22 - Regression Analysis of Sex Education from Parents and Topics Covered: Odds Ratios and 95% Confidence Intervals

	Methods of Birth Control		How to Prevent HIV/AIDS		How to Use a Condom		Where to Get Birth Control	
Variables	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Intercept	1.33	[0.66, 2.68]	1.80	[0.89, 3.62]	2.50	[1.20, 5.22]	0.96	[0.50, 1.83]
Sex								
Female	2.55***	[1.99, 3.27]	0.89	[0.75, 1.07]	0.49***	[0.39, 0.61]	2.26***	[1.79, 2.85]
Male	1.00		1.00		1.00		1.00	
Self-Rated Health								
Good, Fair, Poor	0.90	[0.64, 1.27]	0.89	[0.65, 1.21]	0.77	[0.56, 1.05]	0.98	[0.72, 1.34]
Very Good	0.82	[0.60, 1.11]	0.96	[0.75, 1.24]	1.01	[0.77, 1.32]	0.87	[0.67, 1.14]
Excellent	1.00		1.00		1.00		1.00	
Education								
College Degree	1.59	[0.86, 2.96]	0.79	[0.42, 1.50]	0.41***	[0.23, 0.73]	0.86	[0.48, 1.56]
Some College	1.39*	[1.01, 1.93]	1.07	[0.74, 1.54]	0.95	[0.72, 1.27]	1.28	[0.88, 1.87]
High School Graduate	1.24	[0.93, 1.65]	1.18	[0.82, 1.69]	1.13	[0.79, 1.62]	1.13	[0.80, 1.60]
Less than High School	1.00		1.00		1.00		1.00	
Annual Family Income								
$35K or more	0.95	[0.73, 1.24]	1.08	[0.83, 1.4]	1.00	[0.79, 1.27]	0.91	[0.71, 1.16]
Less than $35K	1.00		1.00		1.00		1.00	
Health Insurance Status								
Not Covered	1.14	[0.76, 1.70]	1.32	[0.89, 1.96]	1.01	[0.68, 1.49]	1.14	[0.83, 1.57]
Medicare	0.92	[0.60, 1.41]	0.80	[0.54, 1.19]	0.95	[0.59, 1.52]	0.81	[0.53, 1.25]
Medicaid	0.85	[0.65, 1.12]	1.19	[0.91, 1.55]	1.19	[0.92, 1.54]	1.15	[0.86, 1.53]
Private	1.00		1.00		1.00		1.00	
Health Care Provider								
None	0.95	[0.67, 1.33]	0.69*	[0.49, 0.97]	1.21	[0.88, 1.68]	0.67	[0.45, 1.00]
Hospital or Urgent Care	1.02	[0.70, 1.50]	0.95	[0.63, 1.45]	1.29	[0.85, 1.94]	0.92	[0.63, 1.35]
Clinic	1.09	[0.78, 1.51]	0.84	[0.58, 1.24]	1.07	[0.76, 1.51]	0.80	[0.57, 1.12]
Private doctor's office	1.00		1.00		1.00		1.00	
Place of Residence								
Not MSA	0.89	[0.58, 1.37]	0.90	[0.60, 1.33]	0.79	[0.56, 1.12]	0.77	[0.51, 1.16]
Other MSA	0.91	[0.71, 1.17]	1.08	[0.78, 1.51]	0.97	[0.73, 1.28]	0.93	[0.72, 1.21]
Principal City of MSA	1.00		1.00		1.00		1.00	

*Note: An OR of 1.00 =referent group; * $p \leq 0.05$; **$p \leq 0.01$; *** $p \leq 0.001$

Table 23 - Regression Analysis of Sex Education from Parents and Topics Covered: Odds Ratios and 95% Confidence Intervals (cont'd)

	Methods of Birth Control		How to Prevent HIV/AIDS		How to Use a Condom		Where to Get Birth Control	
Variables	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Ethnicity								
Hispanic	0.88	[0.62, 1.24]	1.47*	[1.01, 2.12]	1.30	[0.93, 1.82]	1	[0.72, 1.38]
Non-Hispanic	1.00		1.00		1.00		1.00	
Race								
Other	0.60*	[0.40, 0.91]	0.89	[0.55, 1.46]	0.89	[0.63, 1.27]	0.64*	[0.41, 0.98]
Black	0.55***	[0.41, 0.73]	1.51*	[1.04, 2.21]	1.58*	[1.07, 2.32]	0.85	[0.59, 1.22]
White	1.00		1.00		1.00		1.00	
Nativity								
Born Outside of US	0.80	[0.52, 1.24]	0.97	[0.59, 1.61]	0.86	[0.55, 1.33]	0.75	[0.48, 1.17]
US Native	1.00		1.00		1.00		1.00	
Relationship Status								
Married	1.42	[0.87, 2.32]	0.63	[0.38, 1.03]	0.80	[0.45, 1.41]	1.31	[0.75, 2.28]
Living with a Partner	1.74	[0.99, 3.06]	1.10	[0.72, 1.67]	1.49*	[1.07, 2.08]	1.18	[0.77, 1.82]
Single	1.00		1.00		1.00		1.00	
Family Background								
Any Other Family Structure	1.28	[0.95, 1.72]	1.25	[0.95, 1.64]	1.28	[0.98, 1.67]	1.26	[0.99, 1.60]
Two Biological/Adoptive Parents	1.00		1.00		1.00		1.00	
Religion Raised								
Other	0.59	[0.30, 1.15]	0.86	[0.50, 1.49]	0.56	[0.28, 1.14]	0.53	[0.27, 1.05]
Protestant	0.94	[0.60, 1.47]	0.68*	[0.46, 1.00]	0.76	[0.48, 1.19]	0.63*	[0.41, 0.98]
Catholic	0.84	[0.51, 1.38]	0.64	[0.40, 1.02]	0.86	[0.53, 1.40]	0.64*	[0.42, 0.97]
No Religion	1.00		1.00		1.00		1.00	
Religious Attendance at 14								
Never	1.03	[0.68, 1.57]	0.74	[0.51, 1.07]	0.84	[0.57, 1.23]	1.03	[0.72, 1.48]
Less than Once/month	1.14	[0.77, 1.69]	1.17	[0.83, 1.66]	1.21	[0.85, 1.73]	1.51*	[1.07, 2.15]
Once/month to Once/week	1.12	[0.77, 1.63]	1.14	[0.80, 1.63]	1.17	[0.86, 1.58]	1.18	[0.85, 1.65]
Once/week or more	1.00		1.00		1.00		1.00	
Sexual Orientation								
Gay, Lesbian or Bisexual	1.44	[0.85, 2.41]	1.51	[0.99, 2.30]	1.27	[0.78, 2.07]	1.56	[0.98, 2.50]
Straight	1.00		1.00		1.00		1.00	
Sexual Experience								
Has not had sex	0.63***	[0.48, 0.82]	0.64**	[0.47, 0.88]	0.40***	[0.29, 0.54]	0.57***	[0.40, 0.81]
Has had sex with any partner	1.00		1.00		1.00		1.00	
% Correctly Classified	*67.1%*		*61.3%*		*66.5%*		*65.0%*	

Note: An OR of 1.00 =referent group; * p≤0.05; **p≤0.01; *** p≤0.001

Table 24 - Sex Education from a Doctor and Topics Covered

Variables	Doctor	HIV or STDs	Safe Sex	Abstinence
Total	37.1%	92.3%	85.0%	56.1%
Age	**			
15-17 years old	34.0%	93.8%	81.2%	56.8%
18-21 years old	34.5%	91.1%	85.9%	57.7%
22-24 years old	43.2%	92.6%	86.8%	53.8%
Sex	***			***
Female	42.2%	93.3%	86.8%	63.5%
Male	32.1%	91.1%	82.7%	46.6%
Self-Rated Health				
Excellent	36.5%	91.8%	81.8%	55.4%
Very Good	35.4%	91.8%	87.2%	57.5%
Good, Fair, or Poor	40.1%	93.5%	85.5%	53.9%
Education			*	
Less than High School	37.8%	93.4%	81.5%	54.3%
High School Graduate	38.0%	93.0%	87.4%	54.5%
Some College	35.8%	89.9%	84.0%	58.3%
College Degree	34.7%	92.3%	95.4%	63.6%
Occupation				
Employed	38.1%	94.1%	85.9%	58.1%
Unemployed	39.9%	84.5%	73.8%	42.9%
In School	34.1%	92.9%	86.2%	57.6%
Other	37.2%	89.3%	86.0%	53.6%
Annual Family Income	***			
Less than $35,000	41.0%	91.8%	85.3%	53.6%
$35,000 or more	32.9%	93.0%	84.6%	59.3%
Health Insurance Status	***			
Private	31.7%	92.9%	85.4%	61.4%
Medicaid	45.8%	92.1%	84.2%	50.1%
Medicare	35.5%	86.4%	81.3%	54.1%
Not Covered	41.6%	93.1%	86.1%	53.3%
Health Care Provider				
Private doctor's office	37.5%	94.4%	84.4%	60.1%
Clinic	41.1%	88.3%	88.3%	49.5%
Hospital or Urgent Care	36.9%	91.5%	81.2%	60.7%
None	32.6%	91.6%	84.8%	50.2%
Place of Residence				
Principal City of MSA	39.5%	94.4%	88.5%	55.0%
Other MSA	37.1%	91.3%	82.9%	56.4%
Not MSA	31.7%	90.9%	83.3%	57.6%
Ethnicity				
Hispanic	40.3%	91.6%	88.0%	49.0%
Non-Hispanic	36.2%	92.6%	84.0%	58.3%

Note: * $p \le 0.05$; ** $p \le 0.01$; *** $p \le 0.001$

Table 25 - Sex Education from a Doctor and Topics Covered (cont'd)

Variables	Doctor	HIV or STDs	Safe Sex	Abstinence
Race	***		*	
White	34.1%	93.0%	83.5%	56.9%
Black	49.1%	91.9%	90.3%	55.7%
Other	36.6%	90.1%	82.9%	52.9%
Nativity				*
Born Outside of US	34.8%	93.7%	84.4%	40.5%
US Native	37.3%	92.2%	85.0%	57.6%
Primary Language (spoken at home)				
English	36.7%	92.4%	84.9%	57.0%
Spanish	44.2%	90.2%	85.4%	46.1%
Other	29.3%	100.0%	85.9%	59.7%
Relationship Status	*			
Married	29.5%	95.2%	86.8%	45.2%
Living with a Partner	45.1%	94.6%	83.3%	55.0%
Single	36.2%	91.7%	85.2%	56.9%
Family Background	*			
Two Biological/Adoptive Parents	34.0%	92.8%	81.9%	52.5%
Any Other Family Structure	40.5%	92.0%	87.9%	59.4%
Current Religion				
No Religion	34.2%	90.7%	82.2%	51.3%
Catholic	36.8%	92.1%	83.8%	56.2%
Protestant	38.7%	92.6%	87.3%	59.3%
Other	36.4%	95.4%	82.2%	49.3%
Religion Raised				
No Religion	34.9%	88.9%	83.2%	45.6%
Catholic	37.0%	91.5%	85.5%	53.2%
Protestant	36.4%	93.6%	87.0%	61.3%
Other	41.7%	96.0%	80.5%	54.2%
Religious Attendance at 14	*			
Once/week or more	38.0%	91.8%	84.2%	58.8%
Once/month to Once/week	41.9%	95.9%	88.5%	56.5%
Less than Once/month	32.0%	93.2%	88.6%	54.6%
Never	34.0%	91.9%	83.0%	49.9%
Sexual Orientation				
Straight	36.4%	92.3%	84.6%	55.3%
Gay, Lesbian or Bisexual	43.9%	91.7%	87.6%	65.0%
Sexual Experience	***		***	
Has had sex with any partner	42.5%	93.2%	87.3%	55.6%
Has not had sex	25.4%	89.3%	76.6%	57.9%

Note: * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Table 26 - Regression Analysis of Sex Education from a Doctor and Topics Covered: Odds Ratios and 95% Confidence Intervals

	Doctor - Any Topic		HIV or Other STDs		Safe Sex or Condom Use		Abstinence	
Variables	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Intercept	0.80	[0.45, 1.42]	32.86	[7.52, 143.62]	3.72	[1.35, 10.28]	0.56	[0.23, 1.37]
Sex								
Female	1.52***	[1.18, 1.96]	1.53	[0.74, 3.16]	1.43	[0.95, 2.16]	2.13***	[1.49, 3.05]
Male	1.00		1.00		1.00		1.00	
Self-Rated Health								
Good, Fair, Poor	0.97	[0.76, 1.25]	1.00	[0.48, 2.08]	1.30	[0.73, 2.32]	0.94	[0.66, 1.33]
Very Good	0.93	[0.72, 1.19]	0.85	[0.44, 1.64]	1.36	[0.79, 2.32]	0.96	[0.62, 1.49]
Excellent	1.00		1.00		1.00		1.00	
Education								
College Degree	0.72	[0.43, 1.21]	0.47	[0.16, 1.35]	4.45***	[1.66, 11.94]	1.30	[0.63, 2.68]
Some College	0.74*	[0.54, 1.00]	0.45*	[0.20, 1.00]	1.13	[0.58, 2.21]	1.21	[0.76, 1.92]
High School Graduate	0.79	[0.58, 1.08]	0.55	[0.23, 1.32]	1.23	[0.69, 2.19]	1.09	[0.71, 1.66]
Less than High School	1.00		1.00		1.00		1.00	
Annual Family Income								
$35K or more	0.84	[0.66, 1.09]	1.22	[0.71, 2.11]	0.99	[0.61, 1.61]	1.19	[0.86, 1.64]
Less than $35K	1.00		1.00		1.00		1.00	
Health Insurance Status								
Not Covered	1.68***	[1.19, 2.38]	1.13	[0.53, 2.41]	1.03	[0.62, 1.71]	0.99	[0.64, 1.55]
Medicare	1.17	[0.75, 1.81]	0.40	[0.12, 1.32]	0.57	[0.23, 1.43]	0.92	[0.40, 2.11]
Medicaid	1.44*	[1.07, 1.93]	0.82	[0.42, 1.60]	0.70	[0.42, 1.18]	0.77	[0.51, 1.18]
Private	1.00		1.00		1.00		1.00	
Health Care Provider								
None	0.60***	[0.47, 0.77]	0.62	[0.24, 1.63]	0.87	[0.47, 1.61]	0.89	[0.55, 1.44]
Hospital or Urgent Care	0.73	[0.46, 1.16]	0.63	[0.24, 1.65]	0.83	[0.43, 1.60]	1.10	[0.63, 1.94]
Clinic	1.00	[0.75, 1.33]	0.46*	[0.21, 0.98]	1.24	[0.72, 2.11]	0.81	[0.48, 1.37]
Private doctor's office	1.00		1.00		1.00		1.00	
Place of Residence								
Not MSA	0.73	[0.48, 1.10]	0.51	[0.22, 1.19]	0.79	[0.42, 1.49]	1.00	[0.57, 1.74]
Other MSA	1.11	[0.89, 1.40]	0.66	[0.37, 1.17]	0.84	[0.51, 1.37]	1.00	[0.66, 1.51]
Principal City of MSA	1.00		1.00		1.00		1.00	

*Note: An OR of 1.00 =referent group; * p≤0.05; **p≤0.01; *** p≤0.001

Table 27 - Regression Analysis of Sex Education from a Doctor and Topics Covered: Odds Ratios and 95% Confidence Intervals (cont'd)

	Doctor - Any Topic		HIV or Other STDs		Safe Sex or Condom Use		Abstinence	
Variables	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Ethnicity								
Hispanic	1.18	[0.89, 1.57]	0.85	[0.5, 1.45]	1.75*	[1.00, 3.07]	0.81	[0.48, 1.37]
Non-Hispanic	1.00		1.00		1.00		1.00	
Race								
Other	1.05	[0.73, 1.50]	0.67	[0.33, 1.38]	0.96	[0.55, 1.69]	1.02	[0.54, 1.92]
Black	1.62***	[1.24, 2.11]	0.69	[0.31, 1.50]	1.73*	[1.00, 2.99]	0.84	[0.55, 1.28]
White	1.00		1.00		1.00		1.00	
Nativity								
Born Outside of US	0.83	[0.55, 1.23]	1.53	[0.57, 4.12]	0.90	[0.46, 1.76]	0.73	[0.40, 1.33]
US Native	1.00		1.00		1.00		1.00	
Relationship Status								
Married	0.55**	[0.35, 0.88]	2.14	[0.32, 14.41]	0.81	[0.30, 2.21]	0.58	[0.26, 1.30]
Living with a Partner	1.03	[0.71, 1.51]	1.16	[0.52, 2.55]	0.63	[0.39, 1.02]	0.85	[0.54, 1.33]
Single	1.00		1.00		1.00		1.00	
Family Background								
Any Other Family Structure	1.06	[0.81, 1.39]	0.80	[0.48, 1.35]	1.34	[0.79, 2.26]	1.36	[0.97, 1.92]
Two Biological/Adoptive Parents	1.00		1.00		1.00		1.00	
Religion Raised								
Other	1.23	[0.74, 2.06]	2.16	[0.62, 7.55]	0.66	[0.31, 1.38]	1.47	[0.63, 3.43]
Protestant	0.90	[0.66, 1.23]	1.61	[0.58, 4.51]	1.12	[0.65, 1.93]	1.81	[0.91, 3.60]
Catholic	0.93	[0.61, 1.40]	1.10	[0.36, 3.35]	0.88	[0.48, 1.64]	1.55	[0.76, 3.16]
No Religion	1.00		1.00		1.00		1.00	
Religious Attendance at 14								
Never	0.77	[0.57, 1.02]	1.16	[0.52, 2.60]	1.05	[0.59, 1.86]	0.86	[0.54, 1.37]
Less than Once/month	0.75*	[0.57, 1.00]	1.26	[0.65, 2.43]	1.45	[0.87, 2.43]	0.97	[0.55, 1.71]
Once/month to Once/week	1.13	[0.85, 1.49]	2.27*	[1.04, 4.92]	1.58	[0.86, 2.91]	0.91	[0.60, 1.38]
Once/week or more	1.00		1.00		1.00		1.00	
Sexual Orientation								
Gay, Lesbian or Bisexual	0.93	[0.64, 1.35]	0.72	[0.28, 1.84]	0.91	[0.44, 1.87]	1.18	[0.69, 2.02]
Straight	1.00		1.00		1.00		1.00	
Sexual Experience								
Has not had sex	0.38***	[0.30, 0.49]	0.47*	[0.24, 0.95]	0.49**	[0.30, 0.81]	1.08	[0.75, 1.56]
Has had sex with any partner	1.00		1.00		1.00		1.00	
% Correctly Classified	*67.1%*		*92.5%*		*85.3%*		*62.1%*	

*Note: An OR of 1.00 =referent group; * p≤0.05; **p≤0.01; *** p≤0.001

IV. FINDING HEALTH INFORMATION ONLINE: THE ROLE OF HEALTH CARE ACCESS, PERSONAL AUTONOMY, AND DISCRIMINATION EXPERIENCE IN A SEXUAL AND GENDER MINORITY POPULATION.

Abstract

Use of the Internet to find health information helps marginalized groups overcome barriers associated with other information sources, but the study of its use among sexual and gender minorities is often limited to young and/or urban populations. We used data from an online survey of 757 LGBTQ adults who live, work, or play in the state of Nebraska. Demographic characteristics, health care access, minority status, outness to health care provider, personal autonomy, and discrimination experience were compared among participants who did or did not report seeking health information online. There was no difference in employment, income, health insurance status, race, ethnicity, relationship status, place of residence, gender identity, or outness to health care provider. The groups differed significantly in age, sex, education, self-rated health, health care access, sexual orientation, personal autonomy, and discrimination experience. In two logistic regression models, self-rated health ($p \leq .01$), visit to a physician or nurse in the past year ($p \leq .001$), high personal autonomy ($p \leq .001$), satisfaction with control over life decisions ($p \leq .05$) and past experience of discrimination in services ($p \leq .05$) were significant predictors of use of the Internet to find health information. We discuss implications for health care providers and health education professionals.

Introduction

Within the span of one generation, the Internet has changed the health communication landscape. The opportunity to access people, information, and resources enabled by Internet access can be especially valuable for marginalized groups for whom more traditional resources such as health care providers, peers, or other media may not be an option due to lack of access, irrelevance, or stigma associated with their use (Gowen & Winges-Yanez, 2014; Hillier, Mitchell & Ybarra, 2012; Kelley, Su & Britigan, *in press;* King & Dabelko-Schoeny, 2009; Kubicek, Beyer, Weiss, Iverson & Kipke, 2010; Willging, Salvador & Kano, 2006). For sexual and gender minorities, resources available via the Internet may be seen as particularly salient compared to those available from a health care system in which heterosexuality and cisgender identity are generally presumed patient characteristics (Goins & Pye, 2013; Jowett & Peel, 2009). Many studies of sexual and gender minority health focus on LGBTQ (lesbian, gay, bisexual, transgender, queer) youth and urban residents, and measures of sexual orientation and gender identity are noticeably lacking from national population-based surveys (Mayer, Bradford, Makadon, Stall, Goldhammer & Landers, 2008; National Institutes of Health, 2014). To improve the relevance and effectiveness of health communication for sexual and gender minorities, there is a need for more research on online health information seeking to represent a broader spectrum of the LGBTQ population.

LGBTQ Internet use

Research on the online activities of sexual and gender minorities has examined use of the Internet to connect with others by building community support systems and online friendships (Alexander, 2002; McKie, Lachowsky & Milhausen, 2015; Mehra, Merkel & Bishop, 2004; Mustanski, Lyons & Garcia, 2011) or finding romantic and sexual partners (Bauermeister, Leslie-Santana, Johns, Pingel, & Eisenberg, 2011; Cheeseman, Goodlin-Fahncke, & Tewksbury, 2012; Garofalo, Herrick, Mustanski, & Donenberg, 2007; Grov, Breslow, Newcomb, Rosenberger, & Bauermeister, 2014); to enhance personal development by exploring opportunities for identity formation and self-expression (Alexander, 2002; Hillier & Harrison, 2007); and to take charge of personal wellness by testing for HIV (Gilbert et al., 2013), notifying sexual partners of possible exposure to STIs (Mimiaga et al., 2008), or learning about sex and sexuality (Bond, Hefner & Drogos, 2009; Kubicek et al., 2010). Within the sexual and gender minority population, previous studies have found that differences in Internet use exist between demographic subgroups including age (Baams, Jonas, Utz, Bos & Van Der Vuurst, 2011), race (Garofalo et al,, 2007; Kubicek, Carpineto, McDavitt, Weiss & Kipke, 2011), and gender (Magee, Bigelow, DeHaan & Mustanski, 2012). Online activities can have real-world benefits: The experiences of building relationships, exploring identity, and coming out online can increase self-acceptance, lower feelings of marginalization, and lead to more confidently coming out in the offline world (Craig & McInroy, 2014; McKenna & Bargh, 1998).

Benefits of finding health information online

Advances in technology make the Internet more and more accessible: A recent survey from the PEW Research Center found that 64% of adults in the United States own a smart phone, and 63% of smart phone owners use them to find health information online (PEW Research Center, 2015). There are many benefits to using the Internet to find health information: Materials found online can provide in-depth information about health conditions; online resources can offer supporting or contrasting perspectives to those offered by health care providers; ease of Internet access can help people overcome barriers to accessing information from other sources; and online health information access is associated with better knowledge of health topics (Powell, Inglis, Ronnie & Large, 2011;Tian & Robinson, 2009; Yuen, Azuero, & London, 2011). The interactive nature of the Internet allows users to tailor information to their own needs and interests, to create online networks of social and emotional support, and to search for information anonymously (Cline & Haynes, 2001; Moorhead, Hazlett, Harrison, Carroll, Irwin, & Hoving, 2013; Ruppel & Rains, 2012). Finally, the anonymous nature of an online search for health information can be especially appealing for those seeking to avoid stigma associated with certain health issues such as infertility (Slauson-Blevins, McQuillan & Greil, 2013) or mental health (Horgan & Sweeney, 2010; Simmons, Wu, Yang, Bush, & Crofford, 2015).

LGBTQ Internet use for health information

The stigma experienced by sexual and gender minorities is intensified by social conditions, cultural norms, and institutional policies that facilitate discrimination, impact health and development, and inhibit access to health care services (Clift & Kirby, 2012; Cruz, 2014; Hatzenbuehler, 2014; Hatzenbuehler & Link, 2014; Preston, D'Augelli, Kassab, & Starks, 2007; Sperber, Landers, & Lawrence, 2005); therefore, sexual and gender minorities may experience distinct benefits to obtaining health information from online rather than offline sources. For example, the 2013 National School Climate Survey found that 68.4% of students said LGBT-related topics were not included in their school curriculum, and 13.1% said they had been addressed in a negative fashion (Kosciw, Greytak, Palmer, & Boesen, 2014). When health education efforts misrepresent or omit the needs and interests of sexual and gender minorities, online health information can be sought out to compensate for the lack of information or to overcome barriers to accessing relevant health resources (Dehaan, Kuper, Magee, Bigelow & Mustanski, 2013; Hillier, Mitchell, & Ybarra, 2012; Kubicek et al., 2010).

There is often an assumption of patient heterosexuality and cisgender identity in health care settings (Eliason, Chinn, Dibble, & DeJoseph, 2013; Goins & Pye, 2013; Kamen, Smith-Stoner, Heckler, Flannery, & Margolies, 2015). Fear of stigma and discrimination may influence willingness to disclose sexual orientation or gender identity to health care providers – which can limit the relevance and effectiveness of the health education and services that they provide – or even lead individuals to delay obtaining health care in the first place (King & Dabelko-Schoeny, 2009; Petroll & Mosack, 2011; Stein & Bonuck, 2001; van Dam, Koh, & Dibble, 2001). Disclosure of sexual orientation/gender identity is associated with better health outcomes and higher satisfaction with health care (Durso & Meyer, 2013; Kamen, et al., 2015; Mosack, Brouwer, & Petroll, 2013). It is unclear if individuals who have not come out to their health care providers are more likely to address the possible gap in health information by seeking it out online.

Previous research on the role of personal autonomy (a similar concept to locus of control) on the health of sexual and gender minorities has found higher personal autonomy (similar to internal locus of control) to be associated with fewer aging-related concerns (Hostetler, 2012), with less heavy smoking among smokers (Greene & Britton, 2012), and with better self-rated health and higher likelihood to seek health care when needed (King & Orel, 2012). There are no known studies on the role of personal autonomy in online health information seeking among sexual and gender minorities.

Specific Aims

The present study examined the association of demographic variables, health care access, minority status, outness to health care provider, personal autonomy, and discrimination experience with use of the Internet to find health information among a sexual and gender minority sample in Nebraska. We propose the following hypotheses –

Use of the Internet to find health information will be associated with:

1) Lower access to health care and minority status, as these may contribute to lower access to health information from health care providers;
2) Not being out to one's health care provider, as fear of potential stigma in a personal encounter may lead to searching for information from online sources instead;
3) Higher personal autonomy, as this may provide more self-motivation to find needed information;
4) Discrimination experience, as this may lead to a preference for the anonymity and perceived safety of online activity.

Research Methods

Data

The data for this study came from the 2010 Midlands LGBT Community Needs Assessment, an online survey designed to address the gap in information on the health and well-being of Nebraska's LGBT population. The survey was conducted by the Midlands Sexual Health Research Collaborative (MSHRC) from July-November 2010 on the website of the University of Nebraska Medical Center. Respondents were recruited through snowball sampling and public advertisements. Eligible participants were age 19 or older; self-identified as lesbian, gay, bisexual, questioning, or transgender; and either lived, worked or played in Nebraska. Seven hundred seventy respondents completed the entire survey. For additional details on instrument development and participant recruitment see Fisher, Irwin, Coleman, McCarthy & Chavez (2011) or Irwin, Coleman, Fisher & Marasco (2014).

Study Variables

For this study we examined the association of use of the Internet to find health information with demographic variables and measures of health care access, minority status, outness to health care provider, personal autonomy, and discrimination experience. All survey questions had *prefer not to answer* as a response option. Only respondents who responded to the Internet use question and who identified as a sexual minority or as transgender were included in this study.

Use of the Internet to obtain health information was measured by a “yes” or “no” response to the question, “Have you sought health-related information on the Internet within the past 90 days?” In addition to ascertaining respondents’ use of the Internet, this framing of the question gives some indication of the recentness of online activity.

Respondent age was obtained and recoded into the following age groups: 19-29 years, 30-39 years, 40-49 years, and 50 years and older. Respondents ranged in age from 19 to 70 years old. Dichotomous variables were created for all other independent measures except sexual orientation. Gender was coded as male or female – respondents who identified as *intersex* or *other* were not included in this analysis. Highest level of education was coded as college degree (2-year, Bachelors, Masters, or Professional) or no college degree (High school, GED, or some college). Annual income was obtained and categorized into "less than or equal to $25,000" or "greater than $25,000." Employment status was coded as "employed" for those who reported a form of paid income and "unemployed" for those who did not. Similarly, health insurance status was coded as "has health insurance" for those who reported a form of health coverage and "no health insurance" for those who did not. Possible response options to "What is your relationship status?" included marriage or partnership to someone of the same or opposite sex, divorced or widowed and not partnered, single and dating or not dating, or *other*. Responses were coded into "married or partnered" and "not married or partnered." Self-rated health was coded as "excellent or very good" and "less than very good," which included the responses *good, fair,* and *poor*.

Three variables measured access to health care. The first factor – cost barrier to care – was obtained through a *yes* or *no* response to the question, "Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?" The second factor – medical visit – was assessed through a *yes* or *no* response to the question, "In the past year, have you seen any of the following: physician/nurse provider?" The third factor – place of residence – was coded as "urban" or "rural" based on respondents' reported residential zip code.

Four variables related to minority status: race, ethnicity, sexual orientation, and gender identity. Responses to the question, "Which one of these groups would you say best represents your race?" were coded into "White" and "Minority," which included all other responses – *Black or African American, Asian, Native Hawaiian or Other Pacific Islander,* *American Indian or Alaska Native,* and *Other*. Ethnicity was coded directly as "Hispanic" or "Non-Hispanic" based on a *yes* or *no* response to the question, "Are you Hispanic or Latino?" Responses to the question, "Which of the following best describes your sexual orientation?" were "Heterosexual/Straight," "Homosexual/Gay/Lesbian," "Bisexual," "Unsure/Questioning," and "Other." For the purposes of this analysis, "Unsure/Questioning" and "Other" were combined into one response. Gender identity was assessed through a *yes* or *no* response to the question, "Do you identify as transgender/transsexual or gender non-conforming?"

Whether respondents were out to their health care providers was assessed through a *yes* or *no* response to the question, "Does your health care provider (physician/nurse provider) know your sexual orientation and/or gender identity?"

Personal autonomy was measured through a Likert scale response (*agree strongly, agree somewhat, disagree somewhat,* and *disagree strongly*) to two items: "I have control over the decisions that affect my life" and "I am satisfied with the amount of control I have over decisions that affect my life." A "high personal autonomy" variable was created to identify respondents who agreed strongly with both statements.

Discrimination experience related to obtaining health information was measured through a response to how often (*never, once, twice, three or more times*) one of the following happened because someone perceived the respondent to be lesbian, gay, bisexual or transgender: "You were discriminated against for services;" "You were treated unfairly by people in helping jobs (e.g., doctors, nurses, psychiatrists, dentists, school counselors);" and "You were treated unfairly by institutions (schools, universities, law firms, the police, the courts, etc.)." Responses were recoded as "yes" (once or more) and "no" (never). An overall "any discrimination experience" variable was created to identify respondents who had experienced any of these forms of discrimination at least once.

Analyses

All analyses were conducted using SPSS version 22. We first conducted frequency analysis for all variables to obtain a descriptive representation of the sample. Next, we performed chi-square tests of independence to identify significant associations between independent variables and use of the Internet to find health information. Finally, we carried out binary regression analysis to assess whether significant associations remained after controlling for the influence of other variables. Spearman correlations among all variables were examined to check for possible multicollinearity (data not shown); none were above 0.70 and therefore all variables were retained in the regression analysis. Two 4-block regression models were examined to evaluate differing levels of detail in the measurement of personal autonomy and discrimination experience. In each model the first block is demographic factors, the second access to health care, and the third minority status. In Model 1, the fourth block is composed of outness to health care provider and the combined measures for personal autonomy ("high personal autonomy") and discrimination experience ("any discrimination experience") respectively. The fourth block of Model 2 contains outness to health care provider and the component variables for high personal autonomy (“controls life decisions” and “satisfied with control”) and any discrimination experience (“discrimination in services,” “unfair treatment – institutions,” and “unfair treatment – helping jobs”).

Results

After removing from the sample respondents who did not identify as male or female, or as either a sexual minority or transgender, 757 respondents were included in this analysis. Overall, 38.6% of respondents had used the Internet in the past 90 days to access health information (see Table 28). Adults aged 19-29 were the largest age group and made up about two-fifths of the sample (39.0%), followed by a relatively even distribution of the other three age groups. The sample was mostly male (61.9%) and mostly college educated (63.2%). Most respondents had an annual income over $25,000 (67.8%), were employed (91.1%), and had health insurance (83.4%). Over half of the respondents were married or partnered (55.2%), and nearly two-thirds reported excellent or very good health (63.0%).

In the past year, over one-fourth of the sample had experienced a cost barrier to health care (27.2%), but most had visited a physician or nurse (84.6%). One in ten respondents lived in a rural area (10.7%). Respondents of minority race and Hispanic ethnicity made up 8.7% and 4.8% of the sample respectively. Most respondents were homosexual/gay/lesbian (75.5%), followed by bisexual (15.7%), unsure/questioning or some other orientation (5.8%), and heterosexual/straight (2.9%). All heterosexual respondents identified as transgender (data not shown), and transgender respondents made up 11.9% of the sample. More than half of the respondents were out to their health care provider (59.8%).

Most respondents agreed or strongly agreed that they had control over decisions that affect their life (92.0%), but fewer agreed or strongly agreed that they were satisfied with the amount of control they had over decisions that affect their life (80.7%). Overall, 58.0% of the sample strongly agreed that they both had control over life decisions and were satisfied with the amount of control they had.

Reported discrimination experience or unfair treatment was highest from institutions (22.5%), followed by people in helping jobs (19.6%) and services (16.8%). Overall, one-third of respondents (33.6%) had experienced some form of discrimination at least once from one or more of these sources.

Use of the Internet to find health information was significantly associated with age, gender, college education, health insurance status, self-rated health, experiencing a cost barrier to care in the past year, visiting a physician or nurse in the past year, sexual orientation, and all measures of personal autonomy and discrimination experience (see Table 29). Internet use was highest among the 30-39 year old age group (49.7%) and lowest among the 50+ age group (28.7%, $p \leq .001$). Significantly more females than males went online to find health information (45.3% and 33.9% respectively, $p \leq .01$). Use of the Internet was significantly higher among respondents with a college education compared to those without (40.7% and 33.1% respectively, $p < .05$) and among those with health insurance compared to those without (40.5% and 29.8% respectively, $p < .05$). Significantly more respondents whose self-rated health was less than very good went online to find health information compared to those with very good or excellent self-rated health (49.8% and 32.1% respectively, $p \leq .001$).

Online health information seeking was higher among those who had experienced a cost barrier to care in the past year compared to those who had not (45.6% and 35.7% respectively, $p \leq .05$) and among those who had visited a physician or nurse in the past year compared to those who had not (42.4% and 17.2% respectively, $p \leq .001$). Nearly half of those who were bisexual or unsure/questioning/other had used the Internet to find health information in the past 90 days (47.9% and 47.7% respectively) compared to just over one-third of those who were homosexual/gay/lesbian (36.3%) and just over one-fourth of those who were heterosexual/straight (27.3%); this difference was significant ($p \leq .05$).

High personal autonomy and any discrimination experience were both strongly associated with use of the Internet to find health information: More respondents with low personal autonomy sought health information online (49.7% compared to 31.9%, $p \leq .001$), as did respondents who had experienced discrimination once or more in obtaining services, from institutions, or from people in helping jobs (47.8% compared to 34.0%, $p \leq .001$). A closer examination of personal autonomy shows that Internet use was higher among those who did not feel they had control over life decisions (54.4% compared to 38.0%, $p \leq .05$) and among those who were not satisfied with the amount of control they had over life decisions (52.6% compared to 36.1%, $p \leq .001$). Similarly, a more in-depth look at discrimination experience shows that Internet use was higher among those who had experienced discrimination of any form – 54.8% of those who had experienced discrimination in services compared to 35.5% of those who had not (*p*≤.001); 48.5% of those who had experienced unfair treatment from institutions compared to 35.6% of those who had not (*p*≤.01); and 49.0% of those who had experienced unfair treatment from people in helping jobs compared to 36.1% of those who had not (*p*≤.01).

Logistic regression analysis of demographic variables only (Block 1, see Tables 30 & 31) showed that having a college degree is associated with higher odds of having used the Internet in the past 90 days (OR=1.665, *p*≤.05), while excellent or very good self-rated health is associated with lower odds (OR=0.468, *p*≤.001), as was age over 50 years compared to age under 30 years (OR=.502, *p*≤.05). The addition of health care access variables to the regression model (Block 2) only modestly changed these odds, but experiencing a cost barrier to care in the past year and having visited a physician or nurse in the past year were also found to be significantly associated with higher odds of having used the Internet for health information in the past 90 days (OR=1.716, *p*≤.05, OR=5.253, *p*≤.001 respectively). Block 3 variables on minority status were not significantly associated with Internet use, and only slightly modified significant associations in the model, with the exception of decreasing the significance of self-rated health (OR=.501, *p*≤.01).

The fourth block of Model 1 showed high personal autonomy to be significantly associated with lower odds of Internet use (OR=0.497, 95% CI [0.321, 0.771]). The addition of the high personal autonomy and any discrimination experience composite variables lead to increased significance but lower effect of age, and removed the significance of cost barrier to care in Model 1. The fourth block of Model 2 examined the influence of personal autonomy and discrimination experience in more detail; satisfaction with control over life decisions was associated with lower odds of using the Internet to find health information (OR=0.516, 95% CI [0.281, 0.948]) and the experience of discrimination in services was associated with significantly higher odds (OR=2.111, 95% CI [1.133, 3.932]). The addition of these variables to Model 2 lowered the effect but not the significance of the other significant variables in the model; it increased the significance of age.

Nagelkerke R-Square and the Hosmer & Lemeshow goodness-of-fit test showed the four-block models to best fit the data and suggest that Model 2 may be a slightly better fit, although the differences in the percent of responses correctly classified by each model are minor (70.8% for Model 1 and 68.4% for Model 2).

Discussion

We found that sexual and gender minorities represented in our sample had higher odds of using the Internet to obtain health information if they were of a younger age, had a college education, had less than very good health, had visited a physician or nurse in the past year, were not satisfied with the amount of control they had over decisions that affect their life, and had experienced discrimination in obtaining needed services. These results support extant literature regarding the demographic variables age, education and self-rated health (Atkinson, Saperstein, & Pleis, 2009; Bhandari, Shi, & Jung, 2014; Houston & Allison, 2002; Powell, Inglis, Ronnie & Large, 2011; Ybarra & Suman, 2006) and partially support our stated hypotheses.

Regarding our first hypothesis that Internet use to find health information would be associated with lower access to health care and minority status as these may contribute to lower access to health information from health care providers, we found an interesting interplay. Previous research has found limited health care access and especially financial barriers to health care to be positively associated with seeking health information online (Bhandari, Shi & Jung, 2014). It is noteworthy that cost barrier to care is the only predictor to lose significance after the addition of personal autonomy and discrimination experience to the four-block regression models; it is also notable that while the other significant health care access variable – visiting a physician or nurse in the past year – did not lose significance, its effect decreased slightly in Model 2. Despite this decrease, individuals who visited a physician or nurse in the past year had the highest odds of using the Internet to find health information; this finding is consistent with those of other studies which have found that patients use the Internet as a way to supplement information given by their health care provider (Lagan, Sinclair, & George Kernohan, 2010; Powell, Inglis, Ronnie & Large, 2011; Slauson-Blevins, McQuillan & Greil, 2013).

Sexual orientation was the only minority status measure significantly associated with use of the Internet to find health information; individuals who were bisexual or unsure/questioning/other had the highest rates of Internet use, but this significance disappears in the regression model.

Contrary to our second hypothesis, outness to health care provider was not significantly associated with use of the Internet to find health information in our sample.

Regarding our third hypothesis, personal autonomy was indeed significantly associated with use of the Internet to find health information, but not in the direction we expected. Dutta-Bergman (2005, 2004) asserts that use of the Internet to find health information is associated with a health orientation that is high in personal autonomy, which he frames in this context as “patient’s willingness to seek out health information beyond the doctor” (2005, p.7). Autonomy in this study was a broader construct related to a general sense of and satisfaction with control in life. Our finding that use of the Internet to find health information was higher among individuals who had lower personal autonomy, especially lower satisfaction with the amount of control they had in life, stands in contrast to that of Dutta-Bergman. This is the first known study to examine the role of autonomy in the online search for health information in a sexual and gender minority sample. Our results suggest that accessing health information online may be a way for individuals with low personal autonomy – especially those who are not satisfied with the amount of control they have over decisions that affect them – to gain some amount of control over their own health decisions by finding needed information for themselves.

Finally, the results of this study support our fourth hypothesis that discrimination experience is associated with use of the Internet to find health information. Nearly half or more than half of respondents who had experienced any form of discrimination had gone online to find health information in the past 90 days. However, closer examination of discrimination experience reveals that encountering discrimination in obtaining services has the most significant effect compared to perception of unfair treatment from institutions or from people in helping jobs.

Limitations

This study had a number of limitations that constrain the generalizability of the results. First, the data for this study were collected via an online survey, which limited potential respondents to individuals with access to and ability to use the Internet; therefore we cannot apply the results of this study to individuals who do not use the Internet, nor can we address disparities in access to online resources in this population. Second, our dependent variable was limited to use of the Internet to find health information in the past 90 days. It is possible that examination of use of the Internet throughout a larger or shorter timeframe could result in different findings. Third, the survey did not solicit reasons for an online health information search. This additional piece of data could provide a more nuanced perspective on the role of our independent factors in the process of obtaining health information online. Finally, although our sample was composed entirely of sexual and gender minority respondents, the distribution within the sample was predominantly non-Hispanic, White, urban, cisgender, employed and male. A more even distribution of these characteristics in a sexual and gender minority sample could permit improved recommendations for developing health communication that addresses the intersections of sexual orientation and gender identity with other minority group status (Mink, Lindley, & Weinstein, 2014), as well as the diversity of health disparities within the 'sexual and gender minority' label (Blosnich, Farmer, Lee, Silenzio, & Bowen, 2014; Cruz, 2014).

Recommendations

This study supports a few recommendations for health care providers. First, providers should be aware that medical appointments are very strongly associated with use of the Internet to find health information, and that patients may be more likely to go online if they perceive communication with their health care provider to not be patient-centered (Hou & Shim, 2010). Although outness to health care provider was not significant in our study, discrimination experience – which can occur whether or not patients have disclosed their sexual or gender identity – was significant. Health care providers can offer a more positive experience for all patients by addressing the 'heteronormative assumption' in health care through integrating LGBTQ-friendly language and questions into signs, forms, and interactions with patients (Fikar & Keith, 2004; Goins & Pye, 2013). In addition, health care providers can be proactive in providing relevant quality online resources to sexual and gender minority patients (Braccia, 2011; Craig, McInroy, McCready, Cesare, & Pettaway, 2015; Forssell, Poirier, & Kenney, 2012; McKay, 2011; Rubeo, 2009).

Our study also has implications for developers of online health education. Although we found online health information searching to be higher among younger and more educated respondents, the Internet is available to and used by an increasingly diverse audience. To ensure that health messages can be understood and acted upon, health education designers for online audiences should consider the following principle question from Zarcadoolas and Pleasant (2009, p. 319): “do the materials presented match the user's skills, abilities, and level of knowledge so that users can find, understand, analyze, and use that information to make better decisions about health?”

Finally, the finding that accessing health information sources online is associated with lower personal autonomy and dissatisfaction with control over life decisions can inform the development of health communication for this population. While recognizing that the specific needs of individuals along the LGBTQ spectrum can vary considerably (Blosnich, Farmer, Lee, Silenzio, & Bowen, 2014; Cruz, 2014; Kuper, Nussbaum, & Mustanski, 2012), online health education materials on any topic can incorporate targeted resources and specific action steps users can take to increase feelings of control and enhance personal autonomy in health-related decisions.

Tables

Table 28 - Demographic Characteristics (N=757)

Variable	%
Internet use past 90 days	38.6
Age groups	
19-29	39.0
30-39	22.9
40-49	19.3
50+	18.9
Female	38.1
College education	63.2
Annual income >$25,000	67.8
Unemployed	8.9
No health insurance	16.6
Married or partnered	55.2
Excellent or very good health	63.0
Cost barrier to care in past year	27.2
Visited physician or nurse in past year	84.6
Rural	10.7
Minority race	8.7
Hispanic	4.8
Sexual orientation	
Heterosexual/Straight	2.9
Homosexual/Gay/Lesbian	75.5
Bisexual	15.7
Unsure/Questioning/Other	5.8
Transgender	11.9
Not out to health care provider	40.2
High personal autonomy	58.0
Controls life decisions	92.0
Satisfied with control	80.7
Any discrimination experience	33.6
Discrimination in services	16.8
Unfair treatment – institutions	22.5
Unfair treatment – helping jobs	19.6

Table 29 - χ^2 analysis of association with use of the Internet to find health information

Variable	% Yes	Variable (*cont'd*)	% Yes
Age	***	Ethnicity	
19-29	36.3	Hispanic	27.8
30-39	49.7	Non-Hispanic	38.9
40-49	39.7	Sexual orientation	*
50+	28.7	Heterosexual/Straight	27.3
Gender	**	Homosexual/Gay/Lesbian	36.3
Female	45.3	Bisexual	47.9
Male	33.9	Unsure/Questioning/Other	47.7
College education	*	Gender identity	
No college degree	33.1	Transgender	41.1
College degree	40.7	Cisgender	38.3
Annual income		Out to health care provider	
Less than or equal to $25,000	36.6	Yes	41.2
Greater than $25,000	40.0	No	34.1
Employment status		High personal autonomy	***
Employed	37.8	Strongly agree	31.9
Unemployed	46.3	Less than strongly agree	49.7
Health insurance	*	*Controls life decisions*	*
Has health insurance	40.5	Agree	38.0
No health insurance	29.8	Disagree	54.4
Relationship status		*Satisfied with control*	***
Married or partnered	41.0	Agree	36.1
Not married or partnered	35.5	Disagree	52.6
Self-rated health	***	Any discrimination experience	***
Excellent or very good	32.1	Yes	47.8
Less than very good	49.8	No	34.0
Cost barrier to care in past year	*	*Discrimination in services*	***
Yes	45.6	Yes	54.8
No	35.7	No	35.5
Visited physician or nurse in past year	***	*Unfair treatment – institutions*	**
Yes	42.4	Yes	48.5
No	17.2	No	35.6
Place of residence		*Unfair treatment – helping jobs*	**
Urban	40.7	Yes	49.0
Rural	31.1	No	36.1
Race			
White	39.1		
Minority	35.4		

Note: "High personal autonomy" and "Any discrimination experience" variables are based on the italicized variables below them.

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Table 30 - Logistic regression of Internet use to obtain health information in past 90 days on predictor variables

Variable	Block 1	Block 2	Block 3	Block 4, Model 1		Block 4, Model 2	
	Odds Ratio	Odds Ratio	Odds Ratio	Odds Ratio	95% CI	Odds Ratio	95% CI
Age groups							
19-29	---	---	---	---		---	
30-39	1.431	1.409	1.407	1.145	[0.626, 2.094]	1.079	[0.587, 1.982]
40-49	1.016	1.087	1.112	0.986	[0.525, 1.854]	0.920	[0.489, 1.731]
50+	0.502*	0.526*	0.511*	0.404**	[0.207, 0.789]	0.376**	[0.191, 0.742]
Female	1.259	1.137	1.121	1.124	[0.719, 1.757]	1.089	[0.695, 1.707]
College education	1.665*	1.790*	1.803*	1.685*	[1.036, 2.740]	1.712*	[1.047, 2.801]
Annual income >$25,000	1.395	1.429	1.459	1.537	[0.898, 2.631]	1.552	[0.904, 2.662]
Unemployed	1.923	2.235	2.276	2.091	[0.847, 5.164]	2.129	[0.854, 5.311]
No health insurance	0.559	0.501	0.515	0.574	[0.262, 1.260]	0.576	[0.260, 1.275]
Married or partnered	1.245	1.245	1.272	1.247	[0.800, 1.944]	1.123	[0.717, 1.757]
Excellent or very good health	0.468***	0.526**	0.501**	0.506**	[0.325, 0.788]	0.498**	[0.319, 0.778]
Cost barrier to care in past year		1.716*	1.724*	1.438	[0.831, 2.491]	1.377	[0.785, 2.413]
Visited physician or nurse in past year		5.253***	5.302***	5.440***	[2.359, 12.541]	4.947***	[2.163, 11.318]
Rural		0.678	0.680	0.636	[0.296, 1.365]	0.650	[0.300, 1.408]
Minority race			0.438	0.440	[0.180, 1.074]	0.421	[0.174, 1.021]
Hispanic			0.954	1.108	[0.369, 3.327]	1.042	[0.348, 3.117]
Sexual orientation							
Heterosexual/Straight			---	---		---	
Homosexual/Gay/Lesbian			0.351	0.367	[0.072, 1.864]	0.355	[0.070, 1.807]
Bisexual			0.394	0.493	[0.095, 2.555]	0.498	[0.096, 2.588]
Unsure/Questioning/Other			0.518	0.626	[0.107, 3.674]	0.563	[0.096, 3.289]
Transgender			1.082	0.811	[0.329, 2.000]	0.748	[0.298, 1.878]
Not out to health care provider				0.691	[0.418, 1.141]	0.703	[0.424, 1.165]

Note: "High personal autonomy" and "Any discrimination experience" variables are based on the italicized variables below them.

* $p \le .05$; ** $p \le .01$; *** $p \le .001$

Table 31 - Logistic regression of Internet use to obtain health information in past 90 days on predictor variables (cont'd)

Variable	Block 1	Block 2	Block 3	Block 4, Model 1		Block 4, Model 2	
	Odds Ratio	Odds Ratio	Odds Ratio	Odds Ratio	95% CI	Odds Ratio	95% CI
High personal autonomy				0.497***	[0.321, 0.771]		
Controls life decisions						0.765	[0.302, 1.942]
Satisfied with control						0.516*	[0.281, 0.948]
Any discrimination experience				1.550	[0.981, 2.451]		
Discrimination in services						2.111*	[1.133, 3.932]
Unfair treatment – institutions						0.869	[0.472, 1.600]
Unfair treatment – helping jobs						1.337	[0.699, 2.558]
Constant	.522*	.093***	.263	0.428		0.775	
Nagelkerke R-Square	0.116	0.186	0.204	0.246		0.250	
Hosmer & Lemeshow (sig.)	0.084	0.267	0.074	0.714		0.744	
% Classified Correctly	66.9%	67.2%	69.1%	70.8%		68.4%	

Note: "High personal autonomy" and "Any discrimination experience" variables are based on the italicized variables below them.

* *p* ≤ .05; ** *p* ≤ .01; *** *p* ≤ .001

V. DISCUSSION

Summary

This dissertation began with a definition to which we now return – that of health communication as the process of developing, disseminating, exchanging and evaluating the effectiveness of evidence-based information to educate, influence and motivate people about health. The purpose of this research is to explore how application of social location theory may improve data collection on health information access in order to better inform and improve the effectiveness of health communication and messaging. This dissertation proposes a framework based on the idea of social location to understand how people obtain health information. We here address the extent to which three studies of health information access support the use of such a framework, and how its application could improve our understanding of access to health information, and correspondingly, our methods of health communication.

We began with the following research questions (Table 32):

Table 32 - Research Questions, Revisited

	Research Questions
Overarching	1. Could the application of a framework based on the idea of 'social location' improve the effectiveness of measures of health information access? 2. If so, how could such a framework improve our understanding of health information access?
Chapter 2	1. How are elements of social location associated with the use of different sources of health information? 2. How are elements of social location associated with access to health information?
Chapter 3	1. How are elements of social location associated with sources of sex education for teens and young adults (age 15-24)? 2. How are elements of social location associated with the kind of sex education received by teens and young adults (age 15-24)?
Chapter 4	1. How are elements of social location associated with the use of the Internet to find health information for LGBT adults in Nebraska?

In Chapter 2, we found in a survey of adults in Douglas County, Nebraska that all included elements of interest significantly influenced either primary source of health information or the number of sources used. Age, sex, race, education, employment, annual income, and health insurance status had significant impacts on both primary source of health information and the number of sources used. In Chapter 3, we found that in a national survey of teens and young adults aged 15-24, all included elements of interest significantly influenced either source of sex education or topics discussed with those sources. Age, sex, race, education, health insurance status, having a health care provider, self-rated health, relationship status, frequency of religious attendance at age 14, language spoken at home, and sexual experience significantly influenced both source of sex education and topics discussed. In Chapter 4, we found that in a survey of LGBT adults who live, work, or play in Nebraska, age, health status, having a health care provider, experiencing a cost barrier to care in the last year, perceived autonomy, and perceived discrimination experience significantly influenced whether respondents went online to find health information in the 90 days prior to the survey. Table 33 outlines the elements of social location included in our instruments and the significance of their effects on the outcomes of interest in each study.

Table 33 - Elements of Social Location in the Surveys of Interest, Significance on Outcomes

Elements of Social Location	Douglas County Community Health Survey, 2013	National Survey of Family Growth, 2011-2013	Midlands LGBT Community Needs Assessment, 2010
Age	Source*** Quantity *	Source*† Topic***†	Source**
Sex	Source*** Quantity ***	Source*** Topic***	Source
Race	Source***	Source***	Source

	Quantity ***	Topic***	
Ethnicity	Source**	Source	Source
	Quantity	Topic**	
Employment / Occupation	Source***	Source	Source
	Quantity *	Topic***†	
Income	Source**	Source	Source
	Quantity *	Topic**	
Health Insurance	Source**	Source**	Source
	Quantity *	Topic***	
Health Care Provider	Source***	Source***	Source***
	Quantity	Topic***	
Nativity	Source	Topic**	
	Quantity **		
Education	Source***	Source***	Source
	Quantity***	Topic***	
Health Status	Source*	Source*	Source***
	Quantity	Topic**	
Relationship Status	Source***	Source***	Source
	Quantity	Topic*	
Place of Residence		Source	Source
		Topic*	
Family Background		Source	
		Topic*	
Current Religion		Source	
		Topic***†	
Religion Raised		Source	
		Topic*	
Frequency of Religious		Source***	
Attendance age 14		Topic***	
Language		Source***†	
		Topic***†	
Sexual Experience		Source***	
		Topic***	
Sexual Minority		Source	Source
		Topic***	
Transgender			Source
Cost Barrier to Care			Source*
Outness to Health Care Provider			Source
Perceived Autonomy			Source***
Perceived Discrimination			Source*

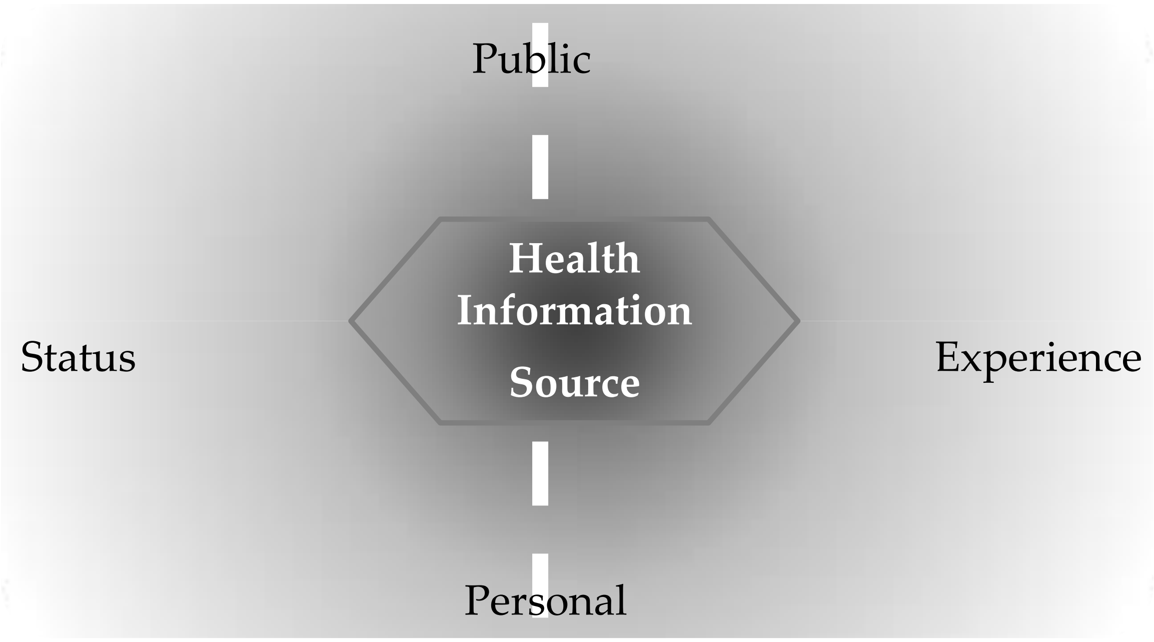
Note: * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; †Significance based on χ^2 analysis because variable was not included in regression model.

Regarding the overall questions, this research demonstrated that elements of social location are significant predictors of health information access – including health information source, number of sources accessed, and health topics addressed – across three populations. This gives credence to the idea that a framework based on the concept of social location could improve our understanding of health information access by allowing us to analyze and interpret results across surveys to identify global patterns, draw more robust conclusions, and drive the development of new research questions.

Synthesis

Applying a Social Location Framework

Figure 6 - Proposed Kelley Social Location Framework, Revisited



Returning to the elements of social location that were identified and included in our analyses, we can regroup them according to the following criteria (see Figure 6):

<u>Status and Experience Domains.</u> These domains are more distinct but there is still room for influence between them. The Status domain represents Ritzer and Bell's *objective* dimension, while the Experience domain represents the *subjective* dimension. If an

element of social location can best be described as a thought, feeling, belief, perspective, or other cognitive function it lies in the Experience domain. If it can best be described as an action, behavior, or state of being it lies in the Status domain.

Personal – Public Continuum. As a visual representation of their interconnectedness, there is no strict division between the personal and the public. Elements of social location fall closer to the personal end of the framework the more they relate to the self; they fall closer to the public end the more they relate to other people.

Of course, the assignment of these elements to a Status/Experience domain and a particular place along the Personal-Public continuum is itself a subjective exercise. It bears noting again that the domains and the continuum are by their very nature intended to interact and flow into each other. What is important here is not an exact placement, but rather a representation of the extent to which each of those categories is addressed in our surveys. My categorization of the elements of social location according to the above criteria is delineated in Table 34.

Table 34- Elements of Social Location within Proposed Framework

Elements of Social Location	Douglas County Community Health Survey, 2013	National Survey of Family Growth, 2011-2013	Midlands LGBT Community Needs Assessment, 2010
Public Status			
Educational Attainment	X	X	X
Employment Status	X	X	X
Income Level	X	X	X
Health Insurance Status	X	X	X
Health Care Provider Seen	X	X	X
Place of Residence		X	X
Personal Status			
Age	X	X	X
Sex	X	X	X

Sexual Orientation		X	X
Gender Identity			X
Race	X	X	X
Ethnicity	X	X	X
Nativity Status	X	X	
Language		X	
Family Structure		X	
Relationship Status	X	X	X
Frequency of Religious Attendance		X	
Sexually Experienced		X	
Outness to Health Care Provider			X
Public Experience			
Religious Affiliation		X	
Cost Barrier to Care			X
Personal Experience			
Self-Rated Health	X	X	X
Perceived Autonomy			X
Perceived Discrimination			X

As is easily seen, the elements of social location included in this study were high on Status-related elements and low on Experience-related elements, while Public and Personal elements were more evenly represented. The Midlands LGBT Community Needs Assessment had the most Experience-related elements.

Sources of Health Information: Cross-sample comparisons of results using the Kelley Social Location Framework

Table 35 - Sources of Health Information across Surveys

Sources of Health Information	Douglas County Community Health Survey, 2013	National Survey of Family Growth, 2011-2013	Midlands LGBT Community Needs Assessment, 2010
Internet	**X**		**X**
Health Care Provider	**X**	**X**	
Formal Source		X	
Parents		X	
Peers	X		
Print Media	X		
Broadcast Media	X		

We will now use the Kelley Social Location Framework to compare results across surveys. Health information source is the third component of the Framework. According to the proposed model:

- Health Information Source. The health information source represents not only a channel of information, but also the social context in which it exists and the quality of informational content it provides.

As Table 35 portrays, all surveys included source of health information as an outcome measure, but only two sources were represented in more than one survey: Internet and Health Care Provider. The fourth component of the Kelley Social Location Framework is the access gradient:

- Access Gradient. The darker center of the gradient represents perfect access to health information, while the lighter edges represent lack of access to health information. This gradient will become useful as we learn which elements of social location hold more significance for accessing health information.

In Table 36, "+" indicates significantly higher odds of using the Internet for health information (placement closer to the center of the framework) and "-" indicates significantly lower odds (placement closer to the edges of the framework).

Internet

One point to mention here is that the method of accessing the Internet was not outlined in the two surveys. In these analyses, using the Internet to find health information could represent access from a home computer, a library, or a mobile device.

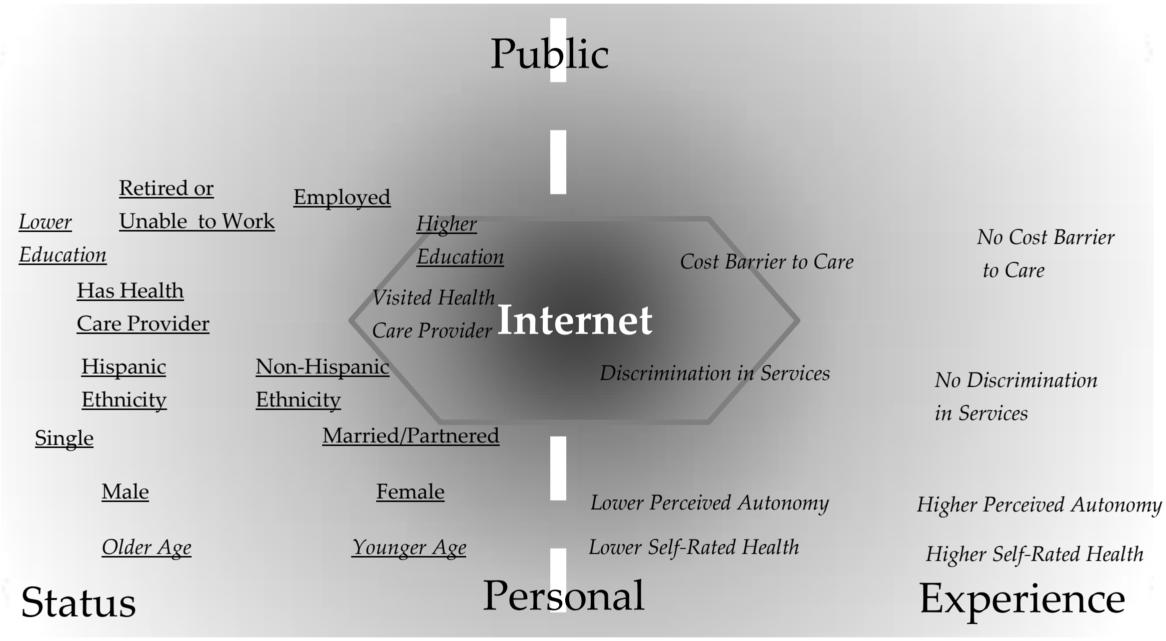
Table 36 – Kelley Social Location Framework Applied to Elements of Social Location - Internet

Elements of Social Location	Douglas County Community Health Survey, 2013	Both Surveys	Midlands LGBT Community Needs Assessment, 2010
Public Status			
Educational Attainment		Higher Ed +	
Employment Status	Retired/Unable to Work -		Not significant
Income Level		Not significant	
Health Insurance Status		Not significant	
Health Care Provider Seen	Has HCP -		Visited HCP +
Place of Residence	Not measured		Not significant
Personal Status			
Age		Older -	
Sex	Female +		Not significant
Sexual Orientation	Not measured		Not significant
Gender Identity	Not measured		Not significant
Race		Not significant	
Ethnicity	Hispanic -		Not significant
Nativity Status	Not significant		Not measured
Relationship Status	Married/Partnered +		Not significant
Outness to Health Care Provider	Not measured		Not significant
Public Experience			
Cost Barrier to Care	Not measured		Yes +
Personal Experience			
Self-Rated Health	Not significant		Better Health -
Perceived Autonomy	Not measured		Higher -
Perceived Discrimination	Not measured		In services +

In both surveys, higher education and younger age predicted Internet use. It is interesting to note that while health insurance status was not significant in either survey, access to a health care provider was – but in opposite ways. For the adult Douglas County sample, access to a health care provider was associated with lower use of the Internet to find health information, while visiting a health care provider in the past year was associated with higher Internet use in the statewide LGBT sample. It is also noteworthy that all of the experiential elements measured in the Midlands LGBT survey had significant effects on health information access.

Figure 7 below demonstrates how the Kelley Social Location Framework can be used to understand and visualize elements of social location as they apply to access to health information. In this Framework, elements of social location sit in either the Status or the Experience domain, with the understanding that these domains influence each other. Elements also sit somewhere along the Personal-Public Continuum. This Framework allows for visual comparisons of how aspects of different elements move closer or further from the health information source at the center of the model, representing increased access and decreased access, respectively.

Figure 7 – Kelley Social Location Framework applied to Internet Access



Note: Douglas County Community Health Survey results are underlined; LGBT Community Needs Assessment results are *italicized.*

In Figure 7 we can visually identify that respondents in the Midlands LGBT survey (*italicized*) who had poor experience on the personal level were more likely to use the Internet as a source of health information. We can also identify that the relative effects of age and education on use of the Internet between the two samples (*underlined and italicized*) were similar.

Health Care Provider

The definitions of "Health Care Provider" differed between the two surveys represented in Table 37. In the Douglas County survey, health care provider could include a doctor, nurse, physician's assistant – anyone who could be identified as a provider of health care services. In the national survey, health care provider was only defined as a doctor. Still, there were some similarities between the surveys.

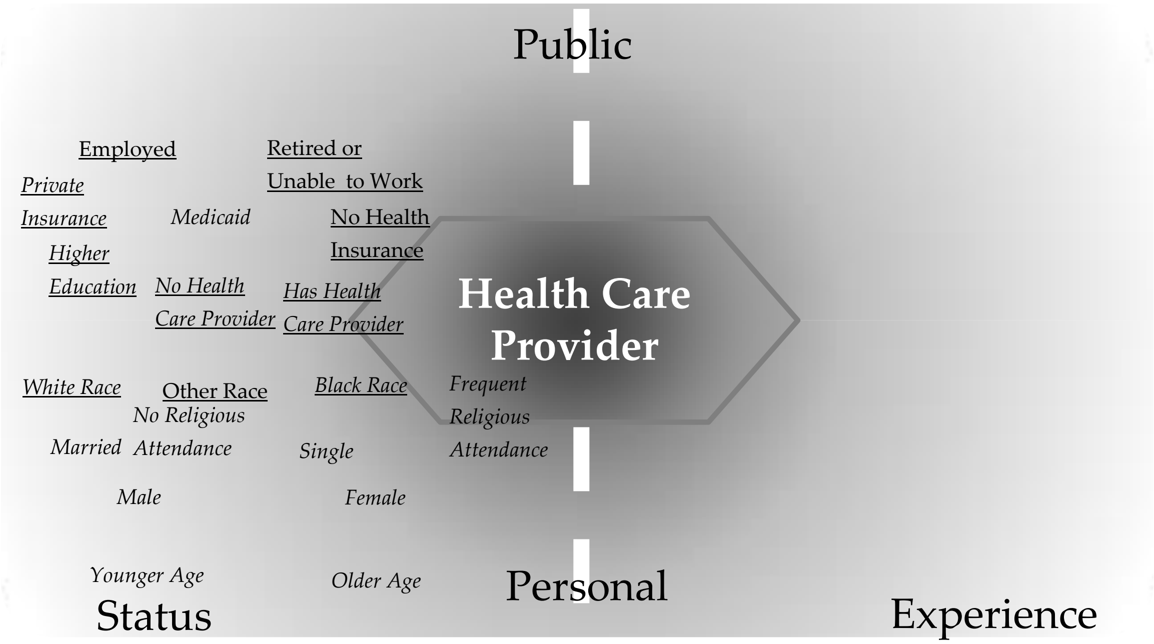
Table 37 - Kelley Social Location Framework Applied to Elements of Social Location - Health Care Provider

Elements of Social Location	Douglas County Community Health Survey, 2013	Both Surveys	National Survey of Family Growth, 2011-2013
Public Status			
Educational Attainment		Higher Ed -	
Employment Status	Retired/Unable +		Not significant
Income Level		Not significant	
Health Insurance Status	"None"	Not private +	"Medicaid"
Health Care Provider Seen		Yes +	
Place of Residence	Not measured		Not significant
Personal Status			
Age	Not significant		Older +
Sex	Not significant		Female +
Sexual Orientation	Not measured		Not significant
Race	Other +	Black +	
Ethnicity		Not significant	
Nativity Status		Not significant	
Language	Not measured		Not significant
Family Structure	Not measured		Not significant

Relationship Status	Not significant	Married -
Frequency of Religious Attendance	Not measured	More Frequent +
Sexually Experienced	Not measured	No -
Public Experience		
Religious Affiliation	Not measured	Not significant
Personal Experience		
Self-Rated Health	Not significant	

In both surveys, higher education predicted lower use of health care providers for health information, while having a health care provider, Black race, and not having private health insurance predicted higher use of a health care provider for health information. The application of these results into the Kelley Social Location Framework in Figure 8 visually depicts the differences in results based on the remaining elements of social location.

Figure 8 – Kelley Social Location Framework Applied to Health Care Provider Access



Note: Douglas County Community Health Survey results are underlined; National Survey of Family Growth results are *italicized*.

The glaring omission in this example is the lack of any experiential elements, although the elements that are represented lie pretty evenly along the Personal-Public Continuum in the Status domain. It is interesting to note that while both surveys showed that not having private health insurance predicted use of a health provider for health information, it was those who had no insurance who were most likely to use a health care provider in the Douglas County survey, and those on Medicaid who were more likely to use a health care provider for health information in the national survey.

Using the Kelley Social Location Framework to Display Quantitative Results: Internet

The Kelley Social Location Framework can be used to visually portray the quantitative relationships between health information sources and significantly influential elements of social location. We consider use of the Internet as an example.

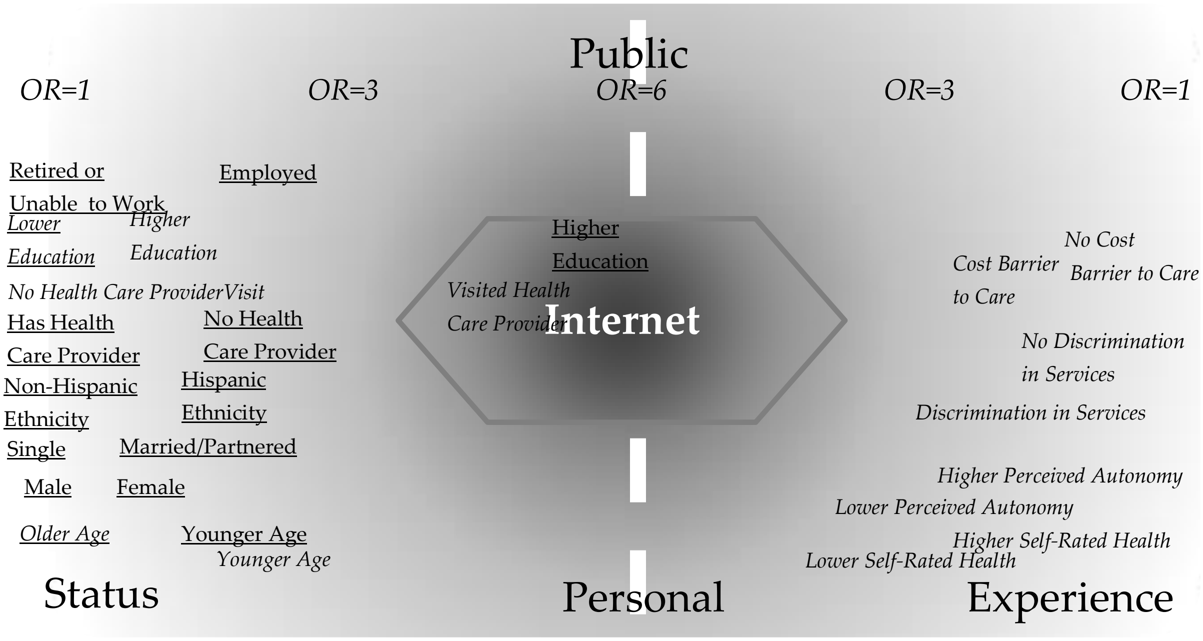
Table 38 – Kelley Social Location Framework Applied to Elements of Social Location - Internet Odds Ratios

Elements of Social Location	Douglas County Community Health Survey, 2013	Both Surveys	Midlands LGBT Community Needs Assessment, 2010
Public Status			
Educational Attainment	6	Higher Ed +	1.7
Employment Status	Retired/Unable to Work -2.5		Not significant
Income Level		Not significant	
Health Insurance Status		Not significant	
Health Care Provider Seen	Has HCP -2.78		Visited HCP +5.4
Place of Residence	Not measured		Not significant
Personal Status			
Age	-2.2	Older -	-2.6
Sex	Female +1.39		Not significant
Sexual Orientation	Not measured		Not significant
Gender Identity	Not measured		Not significant
Race		Not significant	
Ethnicity	Hispanic -1.96		Not significant
Nativity Status	Not significant		Not measured
Relationship Status	Married/Partnered +1.53		Not significant

Outness to Health Care Provider	Not measured	Not significant
Public Experience		
Cost Barrier to Care	Not measured	Yes +1.7
Personal Experience		
Self-Rated Health	Not significant	Better Health -2
Perceived Autonomy	Not measured	Higher -2
Perceived Discrimination	Not measured	In services +2.11

Table 38 shows the odds ratios for using the Internet to find health information associated with each element of social location. To make the visualization more intuitive, the negative odds ratios in the table are the negative inverse of odds between the values of 0 and 1.

Figure 9 – Kelley Social Location Framework Applied to Internet Access: Odds Ratios



Note: Douglas County Community Health Survey results are underlined;
LGBT Community Needs Assessment results are *italicized.*

Figure 9 gives an indication of the strength of each predictor variable between the two surveys. Here we can compare and contrast between the relative influence of different elements of social location between surveys. For instance, higher education was a significant predictor for Internet access for both samples, but this application of the Kelley Social Location Framework shows that the strength of the effect was much higher for the Douglas County sample. In addition, while we can see that the Experience elements stayed below an OR of 3, they are still less represented in this analysis than Status elements.

Kelley Social Location Framework: Final Thoughts

While it would be ideal to have clear-cut formulations of social realities and constructs, one would be hard-pressed to definitively categorize every possible element of social location into one 'quadrant' of this framework. However, it is the idea of including in the analysis of health information access factors that represent each quadrant that is key. Including only Personal or Public, or only Status or Experience components provides a limited perspective. This research demonstrates that elements of social location across the Personal-Public and Status-Experience spectra influence access to health information across populations, sources of information, and topics covered, and reveals the potential usefulness of the Kelley Social Location Framework as a way to inform the development of more consistent and comprehensive measures of health information access. The Kelley Social Location Framework can be a helpful tool to obtain a more comprehensive understanding of the social location of priority populations and thereby improve the value and effectiveness of health communication efforts.

Limitations

A significant limitation of the Kelley Social Location Framework in this analysis is that definitions differ between elements of social location and between sources of health information. Different or limited categorizations of variables such as age, employment, race, ethnicity, and others make it difficult but not impossible to compare across surveys. In addition, each survey was designed for different populations and purposes, so the elements measured are different across surveys, as became evident with the lack of elements in the Experience domain. This makes it difficult to compare between elements of social location. The difference between populations and scopes of the studies makes it difficult to interpret similarities and contrasts between the effects of similar elements of social location on sources of health information. Finally, the differences among all of these research components meant that methods of analysis between surveys differed to some extent, although the same basic approach was used for each study: describe the sample, identify significant associations, and identify significant predictors. In spite of these limitations, we were able to justify in this research the use of a social location-based framework to understand access to health information, if not between surveys, then at least within them.

Implications for Public Health Practice

One of the fundamental tenets of effective health communication is to understand the priority population. In the process of gathering data on how a population gets health information, consideration of the Personal-Public Continuum and the Status-Experience

Domains can impart a more informed and insightful perspective on their specific characteristics and needs. The Kelley Social Location Framework may be most effective in designing an assessment of health information access if there are elements of social location in each quadrant. In this study we found that the Midlands LGBT survey which included the most Experience also found those elements to be significant in predicting use of a specific health information source; after all, we do not exist in a vacuum: how one exists within society and how one experiences that existence are two different things, and each has effects on health decisions, behaviors, and outcomes.

In identifying the elements of social location and the outcome variables to include in an assessment of health information access, it is important to establish clear definitions in order to make the measures consistent and increase their interpretability. The use of standardized and validated measures such as items from the Behavioral Health Factor Surveillance Survey or the Health Information National Trends Survey will improve reliability and facilitate straightforward analysis and interpretation of results.

Once social location data is gathered, placement on an access gradient within the Kelley Social Location Framework can help to visually convey the role of different elements of social location in predicting access to health information.

Future Directions and Dissemination

Future iterations of this research should examine the usefulness of the Kelley Social Location Framework to understand and visually convey interactions between elements of social location. In her study of minority and impoverished women, Austin (2005) applied an interactive social location model to demonstrate how the intersection of multiple levels of social location – race, ethnicity, and social class – influence sexual health practices. A clear visual depiction of interactions between elements of social location could improve not only the understanding of how the elements influence a health outcome, but also the ability of health researchers to meaningfully convey that interaction.

Chapter 2 has been submitted to and is in press in *Health Communication.*

Chapter 3 will be submitted to *American Journal of Public Health* or *Journal of Sex Research.*

Chapter 4 will be submitted to *Journal of Sex Research* or *Health Communication.*

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