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Assessment of Technology Use and Technology Preferences for HIV Prevention Among Hispanic Women

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Abstract

Introduction: HIV transmission presents an ongoing risk to Hispanic women, and prevention efforts remain a priority. The use of technology to prevent HIV transmission among Hispanic women and those of lower socioeconomic status underscore the need for effective implementation of technology. The purpose of this study is to describe technology preferences and predictors of the use of the internet for HIV prevention among low-income Hispanic women.

Method: A secondary analysis was conducted using baseline data from an intervention to prevent HIV among 320 Hispanic women. The parent study was SEPA, Salud (health), Educación (education), Promoción (promotion), y [and] Autocuidado (self-care).

Results: Most participants reported using personal technology, such as smartphones (90.6%), the internet (78.1%), and personal email (67.5%), every day. Most (71.3%) participants were open to learning about HIV education via the internet. In the logistic regression analysis, education and time since the last visit to the health care provider were significant predictors of the use of the internet to learn about HIV prevention, after controlling for age, living with the partner, and years living in the United States.

Conclusion: Hispanic women demonstrated high levels of comfort with different forms of technology. These results indicated the potential to expand future HIV intervention efforts by implementing electronic dissemination of bilingual and culturally appropriate information for Hispanic women of diverse ages.

Keywords

HIV; prevention; technology; smartphones; internet

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Authors' Note

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Declaration of Conflicting Interests

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Introduction

Human immunodeficiency virus (HIV) is a danger to the health of the Hispanic population in the United States and affects them in a disproportionate manner (Centers for Disease Control and Prevention [CDC], 2018). While Hispanics represented 17% of the total U.S. population in 2015, they contributed approximately 24% of new HIV diagnoses (CDC, 2017). Hispanics have the second highest HIV incidence rate of all racial groups in the United States, nearly three times that of Whites (Kaiser Family Foundation, 2014).

HIV specifically threatens the health of Hispanic women. In 2015, it was estimated that among Hispanics, 12% of new HIV infections were in Hispanic women, with the majority (90%) of these cases attributed to heterosexual contact (CDC, 2018). In Florida, the rate of Hispanic females living with HIV diagnosis is 2.5 times that of White females (AIDSvu, 2018). These alarming statistics highlight the need to develop preventative initiatives to decrease the HIV risk factors for this population.

There is potential to decrease prominent HIV risk factors while increasing preventative measures via the use of technological platforms such as the internet or mobile applications (apps) accessible on hardware devices (e.g., personal computers, phones, and tablets; Bull, Pratte, Whitesell, Rietmeijer, & McFarlane, 2009; Mitchell, 2015; Noar, Black, & Pierce, 2009; Ritterband & Tate, 2009; Shrestha, Karki, & Copenhaver, 2017; Swendeman & Rotheram-Borus, 2010; Villegas et al., 2014; Villegas et al., 2015). These technologies can provide access to the appropriate information and/or HIV prevention interventions (Bull et al., 2009; Noar et al., 2009; Ritterband & Tate, 2009; Swendeman & Rotheram-Borus, 2010; Villegas et al., 2014; Villegas et al., 2015). Among Hispanic women, access to an internet platform showed a positive influence on reducing barriers to accessing STI/HIV preventive interventions, and it also encouraged preventative behaviors (Villegas et al., 2014; Villegas et al., 2015).

Research shows that Hispanics adapt to mobile technology swiftly and embrace technology at a faster rate than Blacks or Whites of the same age range (Pew Research Center, 2016). In the United States, Hispanic adults are among the most likely to own a smartphone, access the internet from a mobile device, and use mobile applications and tablets (Association of Hispanic Advertising Agencies, 2012; Lopez, Gonzalez-Barrera, & Patten, 2013; Pew Research Center, 2016). It is estimated that Hispanics spend over an average of 14 hours a week using these forms of technology (Nielsen Mobile Insights, 2015).

While the use of technology has blossomed among the Hispanic population, several factors affect the differences in use among Hispanics. According to Fox and Livingston (2007), most of the information available on the internet is in English. For those whose primary language is not English, accessing information or using these technologies can be a very difficult and complex task (Wells, Vazquez-Otero, Bredice, Meade, & Chaet, 2015). Concerns with limited knowledge regarding use of computers and similar technologies, as well as level of education and use of technology, may affect the utilization of internet programs among Hispanic women (Wells et al., 2015). Among Hispanics who have not completed high school, internet use is estimated to be at 31% (Fox & Livingston, 2007).

Lower levels of education are associated with less utilization of the internet, e-mail, and text messaging (Leite et al., 2014; Pew Research Center, 2016).

Technology use among Hispanics has also been linked with age. The literature describes that the use of both multimedia and technological devices decreases with age for Hispanics (Ramirez et al., 2014). However, regardless of age, many Hispanics have access and exposure to these technologies because they live with a partner who has access. Wells et al. (2015) discovered that 77% ($n = 20$) of their participants had a family member living in their home who had used a computer, and 61.5% ($n = 16$) reported ever having used a computer. Therefore, it can be hypothesized that they have access to technological platforms, even if it is through someone else.

Other factors such as acculturation (Brown, Lopez, & Lopez, 2016) and living with a family member who owns a computer (Wells et al., 2015) have been associated with increases in internet usage among Hispanics in the United States. Based on data from the Pew Research Center, internet use among Hispanics has significantly increased over the years from 64% in 2009 to 81% in 2015 (Brown et al., 2016). This increase is a result of increments in internet use among U.S. immigrant Hispanics and Spanish-dominant Hispanics from 2009 to 2015 (Brown et al., 2016). While this survey presents no specific association between immigration and internet use, it can be hypothesized that incremental growth of internet use among the Hispanic immigrants is related to the influence of acculturation on social media engagement (Massa, 2013). Based on evidence in the literature, it is suggested that immigrated Hispanics visit social media to learn about the American culture (Massa, 2013).

Studies have also demonstrated that Native-born Hispanics and those less assimilated to the American culture are more likely to lack a regular health care provider (Livingston, Minushkin, & Cohn, 2008). This finding is supported by Peña-Purcell's (2008) study, which shows that Hispanics are likely to visit the internet for medical advice and other health decision-seeking behaviors. As a result, 51% of Hispanics visit the internet for medical advice and health decision-seeking behaviors before seeing a medical professional (Peña-Purcell, 2008). In addition, living with a partner who has access to these technologies may further enhance/facilitate the use of technology and the internet among Hispanic women (Wells et al., 2015).

Even when the literature describes an increase in the use of technology among Hispanics, little is known regarding Hispanic women's use and preferences regarding digital technology for prevention of HIV. The purpose of this study is to describe technology preferences and predictors of the use of the internet for HIV prevention among low-income Hispanic women. This research will aid in determining the kind of technology that is widely used and ways it can be used for HIV prevention education.

Methodology

Design

This study is a secondary analysis that uses quantitative baseline data from the study SEPA III: The Effectiveness Trial. SEPA stands for *Salud, Educación, Prevención y Autocuidado*,

which translates to Health, Education, Prevention, and Self-Care. SEPA III, the parent study, is a randomized controlled experimental study that evaluates the effectiveness of an intervention (SEPA) to increase HIV prevention behaviors and to reduce the incidence of sexually transmitted infections (STIs) for Hispanic women (Peragallo et al., 2018). Data used in this study were collected from 320 Hispanic women enrolled in the study.

Sample and Setting

Participants for this study were recruited through the distribution of flyers and outreach in two health care centers at the Florida Department of Health, the Miami Refugee Center, and public places (e.g., churches, clinics, supermarkets) in Miami-Dade County. Eligibility criteria included self-identifying as Hispanic, being between 18 and 50 years of age, and reporting sexual activity within the last 3 months. Women were excluded from participation if they had ever participated in another structured HIV program in the past 6 months.

Data Collection and Ethical Issues

Female bilingual assessors administered study measures through face-to-face interviews using a structure quantitative questionnaire. For these measures, participants selected their language of preference, English or Spanish. Interviews were conducted in private offices. Assessors used a research management software system (Velos) to document participants' responses to questions directly into the computer.

The study obtained approval from the Florida Department of Health Institutional Review Board. All participants signed the consent form prior to their participation in the study.

Variables in the Study

Demographic.—This questionnaire consisted of 18 items that addressed questions related to sociodemographic characteristics (e.g., age, education, religion, relationship status, occupation, years living in the United States, income, living with a partner). This questionnaire is a standardized demographic form specifically designed for studies at the research center called El Centro in which this study was conducted (Mitrani, O'Day, Norris, & Adebayo, 2017).

Use of Technology.—Four questions gathered information about the use of technology among Hispanic women. These questions had a dichotomous response (yes/no) and measured the following information regarding participant behavior during the previous month: (a) access to technology (if the woman had a device such as a smartphone, DVD/CD or any other video player, tablets/i-Pad, or access to internet/internet applications), (b) frequency of use (how often they used any of the technologies mentioned above), (c) place where they used these technologies (at home, at friends or family home, or other location), and (d) preferred activities online (if they used the internet, what they liked to do the most online, e.g., chat rooms, blogs, music). These questions were adapted by Cianelli and Villegas (Cianelli et al., 2013; Villegas et al., 2014; Villegas et al., 2015) from previous studies that measured the use of technology (Child Exploitation and Online Protection Centre, 2009) and were available in English and Spanish.

Technology Use to Learn About HIV.—One question collected data about the use of technology (e.g., smartphone, internet, e-mail, video including DVD or CD, and/or a table/i-Pad) to learn about HIV. The question had a dichotomous response (yes/no) and measured whether participants would like to learn about HIV using technology. This question was adapted by Villegas (2012) from previous studies that measured the use of technology (Child Exploitation and Online Protection Centre, 2009) and was available in English and Spanish.

Statistical Analysis

SPSS version 22.0 was used to analyze the descriptive information about women's sociodemographic characteristics and their use of technology. In addition, logistic regression was conducted to examine predictors of the most frequent technology (the internet) used to learn about HIV prevention (i.e., using the internet to learn about HIV prevention or not using the internet to learn about HIV prevention).

In terms of regression analysis, the variable living with a partner (0 = not living with partner, 1 = living with partner) and years living in the United States were dichotomized (0 = less than 5 years living in the United States; 1 = 5 or more than 5 years living in the United States). The variables education, age, and time since the last visit to the health care provider were listed as continuous.

The Hosmer and Lemshow statistic allows for the evaluation of goodness of fit by the researcher creating 10 ordered groups of participants and then comparing the actual number in each group (observed) to the number “predicted” by the logistic regression model (predicted).

Results

Sociodemographic Characteristics of the Sample

Table 1 shows characteristics of the women in this study. Most women (96%) were born outside the United States. The majority of women were living with their spouse or partner (68%) and had less than 5 years living in the United States (60%). The average length of time in the United States was 8.50 ($SD = 8.25$) years. Average age of the women was 34.79 ($SD = 9.23$) years, and average education was 13.73 ($SD = 3.34$) years. The majority ($n = 300$, 94%) of women preferred Spanish, followed by those ($n = 14$, 4%) preferring English, and 6 women that (2%) preferred both Spanish and English. The average time (months) since they last saw the doctor or health care provider was 9.4 ± 14.6 months.

Use of Technology

Access to Technology.—Regarding access of various device options, participants reported smartphones (90.6%) as the most available and accessible device, followed by DVD/CD/video players (88.1%) and tablets/i-Pads (42.8%). Internet was the most used technology, with 93.8% of women using it. Also, personal email was highly used (88.1%).

Frequency of Use.—During the previous month, participants reported using most of the technologies and the internet on a daily basis. The everyday use was found highest for

smartphones (90.6%), the internet (78.1%), and e-mail (67.5%). The use of DVD/CD/video and tablet/i-Pad every day were low (12.5% and 23.8%, respectively), but it is important to mention that the usage increased when asked them about their use once a week (84% and 40.6%, respectively).

Places Where Technology Was Used.—Technologies were mostly used at home. The internet (91.3%) was the most highly used at home followed by smartphones (90.9%), personal e-mail (87.2%), DVD/CD/video (79.4%), and tablets/i-Pads (40%). Other mentioned locations and/or situations in which technology was used at a friend's or family member's home, or when traveling.

Preferred Activities Online.—Participants reported using the internet for reading/watching the news (70.3%), shopping (60.3%), web browsing (52.2%), instant messaging (MSN; 49.4%), and social networking (26.6%). The least mentioned uses were chat rooms (15%), blogs (15.9%), and music (19.7%).

Technology Use to Learn About HIV.—The majority of participants (71.3%) indicated that the internet was the most favorable way to learn about HIV. Only 37.2% mentioned that they would like to learn using DVD/CD/video, followed by 27.8% who mentioned personal e-mail, 25.3% who mentioned smartphones, and 9.1% who mentioned tablets/i-Pads to learn about HIV.

Predictors of the Use of Technology to Learn About STI and HIV Prevention—Hosmer and Lemeshow statistic was not significant, $\chi^2 = 14.095$, $p = .079$, indicating that prediction does not differ significantly from the observed. Therefore, the model is appropriate for predicting those participants who use the internet to learn about HIV.

Additionally, the overall model fit was assessed using the chisquare test. For this model LR, $\chi^2(372, 411) = 11.523$, $p < .042$, reflecting that at least one of the independent variables contribute to the predicted outcome. Thus, this model explains 3.5% to 5.1% of the variation in the use of the internet to learn about HIV (Cox and Snell $R^2 = .035$ and Nagelkerke $R^2 = .051$).

In the logistic regression analysis, education and time since the last visit to the health care provider were significant predictors of the use of the internet to learn about HIV prevention, after controlling for age, living with the partner, and years living in the United States. Participants who use the internet to learn about HIV had a higher probability of reporting lower levels of education (odds ratio = 1.113, 95% confidence interval) and more time has passed since the last visit to a health care provider (odds ratio = 1.017, 95% confidence interval), as shown in Table 2.

Discussion

The findings from this investigation contribute substantially to our understanding of the use of technology among Hispanic women and how technology may be implemented as a facet of HIV education on preventative measures. The results indicate that members of this

population appear to have a high level of access to and comfort with various means of technology and electronic dissemination of health-related information. This finding is somewhat unexpected in light of the vulnerable population included in the study, minority women of relatively low socioeconomic status. This contradicts previous findings that Hispanics and other minorities demonstrate barriers to effective utilization of technology (Fox & Livingston, 2007; Leite et al., 2014; Livingston, 2011). Nevertheless, these results are consistent with previous research indicating a relative narrowing over time of the digital divide between Hispanics and other ethnic groups (Campos-Castillo, 2015).

The findings of this study provide a unique perspective regarding a predominantly Spanish-speaking population whose technology preferences have not been sufficiently examined. Most important, among members of this low-income group, access to quality technology is generally high. In addition, age was not found to be an issue that affects its utilization. This result was somewhat surprising, as previous studies indicate that women may be less disposed to access technology for health information than those of younger age (Dang, Estrada, Bresee, & Phillips, 2013; Kratzke, Wilson, & Vilchis, 2013). This investigation presents several distinct opportunities for HIV prevention efforts among Hispanic women. More than 90% of the participants reported having smartphones, and more than 70% indicated a willingness to use the internet to learn about HIV. With a substantial majority of Hispanic women in the sample indicating the ability and openness to receive HIV education in this manner, future potentially cost-effective interventions could be designed to target this population of women. Of note, recent efforts have been made using a community-based participatory research approach to provide mobile health interventions to Hispanic families to address mental health issues (Ginossar & Nelson, 2010). Similar strategies could be considered for HIV prevention among Hispanic women.

This study further indicates the feasibility of implementing HIV prevention strategies among this population. As indicated by this investigation and other pilot studies (Villegas et al., 2014; Villegas et al., 2015), women are using technology daily and have demonstrated interest in learning how to get more out of the Internet.

At the same time, HIV prevention efforts must continue to reach out to those Hispanic women who are not participating in electronic technology, whether for socioeconomic, cultural, or other reasons. In particular, the persistence of the language divide prevalent in this population must be considered, especially regarding the availability of Spanish language health information provided on the Internet (De Jesus & Xiao, 2012). In addition, the use of technology may be considered as a means to expand the reach of face-to-face prevention models by, for example, integrating technology with elements of social networking to provide a “hybrid” intervention with an in-person element (Kreps & Neuhauser, 2010; McFarlane & Bull, 2007).

Another important observation in this investigation is the association between length of time between health care provider visits and the use of the internet to learn about HIV prevention, as well the relationship between education and the use of the internet learn about HIV prevention. These relationships underscore the potential for technology to bridge the health information disparities often experienced by vulnerable populations experiencing barriers to

access to health care related to ethnic or socioeconomic disparities (Beacom & Newman, 2010). While the high levels of electronic literacy among participants in the study can be regarded as positive, web-based health information may be of varying quality (Fahy, Hardikar, Fox, & Mackay, 2014; Raja, 2016). It is imperative to ensure that women not rely on technology as a substitute for adequate health care. Moreover, health care educators active in HIV prevention efforts should continue work to expand outreach among women with fewer years of education and be vigilant to combatting misinformation found on the internet.

Limitations

One limitation of this study was that it captured each respondent's use of technology only at a single point in time. In addition, all the data was self-reported, which allowed for respondents to provide answers with regard to their use of technology that they may have perceived as desirable (Van de Mortel, 2008).

It should also be noted that this study was conducted among a South Florida population of Hispanic women originating primarily in Cuba (55% of the sample). As a result, the findings from this investigation may not be generalizable to other populations of Hispanic women. This includes those residing in other parts of the United States or those of different national origins. Nevertheless, the findings appear consistent with previously noted recent trends that Hispanics are participating in technology at high rates, as well as research indicating that the women of Hispanic origin have made increases in this regard (Campos-Castillo, 2015).

Conclusion

The results from this investigation point to the need for several areas of further inquiry. As information exchange in society is increasingly conducted through personal technology such as smartphones and emails, it is essential that continued HIV prevention efforts conducted through these means incorporate the needs of the Hispanic women. This includes culturally competent educational endeavors as well as an awareness that some members of the population may be relying on this health information at a time when they are experiencing barriers in accessing in-person health care. Developing bilingual, culturally appropriate, and relevant communication about HIV prevention, such as condom use, that can be disseminated using contemporary technology presents an opportunity to decrease risk for sexually transmitted diseases among this vulnerable population. Such efforts involving technology merit further testing and ultimately implementation as part of comprehensive HIV prevention programs.

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Table 1.

Characteristics of Hispanic Women.

Characteristics	<i>M</i>	<i>SD</i>
Age, years	34.79	9.23
Education, years	13.73	3.39
Monthly family income, \$	1690.84	1048.52
Time in the United States, years	8.5	8.25
Number of children	1.37	1.21
	<i>n</i>	%
Living with spouse/partner	219	68
Employed	91	28
Birthplace		
Cuba	175	55
Nicaragua	30	9
Colombia	29	9
Honduras	27	8
Dominican Republic	15	5
United States	14	4
Venezuela	8	3

Note. Eight birth nations not described each had less than 1% of respondents each.

Table 2.

Logistic Regression Analysis Predicting the Use of the Internet to Learn About HIV.

Variable	β	Odds Ratio	95% CI for Exp(<i>b</i>)	
			Lower	Upper
Education	0.107 *	1.113	1.028	1.206
Age	0.006	1.006	0.978	1.034
Time since the last visit to a health care provider (months)	0.017 *	1.017	1.001	1.034
Living with the partner	-0.177	0.837	0.485	1.445
Years living in the United States (<5)	-0.340	0.712	0.421	1.204
Constant	-2.892	0.055		

Note. CI = confidence interval.

* $p < .05$.

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