

Media and Technology Use Among Hispanics/Latinos in New York: Implications for Health Communication Programs

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Received: 30 June 2015 / Revised: 23 August 2015 / Accepted: 20 September 2015 / Published online: 20 October 2015
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Abstract

Objectives There is limited information about media and technology use, as well as health information-seeking patterns, specifically for Hispanics/Latinos at the state level. An understanding of access, usage patterns, and preferences for receiving health information is critical for state-level organizations to effectively reach and serve this growing population.

Design A telephone survey was developed to assess media and technology access, use patterns, health-seeking information patterns, and preferences for receiving health information. The survey was conducted in New York state from August 8 to November 4, 2013, using random digit dialing. The overall sample of 1350 included 412 Hispanic/Latino adults who are the focus of this study.

Results Most Hispanic/Latino respondents reported having at least one working computer at home (78 %) and using the Internet (84 %); almost all who had a computer reported having high-speed Internet service (90 %). Cell phone ownership was common (88 %), and many had a smartphone (71 %). Activities most likely to occur several times per day were sending text messages (61 %), using phone apps (49 %), using a search engine (40 %), using email (34 %), and using social

networking sites (32 %). The most preferred channels of receiving health information were websites, mail, and television. Older respondents were significantly less likely to have the technologies, engage in technology activities, and prefer newer forms of information dissemination (i.e., text messages). Education and income were important predictors in some cases.

Conclusions While most Hispanics/Latinos have access to various technologies, the reason for using those technologies and preferences for receiving health information most often varies by age and, sometimes, by education and income. Older adults tend to seek health information from traditional sources such as television and brochures, while younger adults favored newer technologies. Knowing preferences of the population can help ensure proper media channels are selected for dissemination of health information to Hispanic/Latino communities.

Keywords Hispanic · Latino · Media · New York · Internet · Health information

Background

Hispanics/Latinos have comprised more than half of the overall population growth in the USA between 2000 and 2010 (US Census Bureau, 2011) and represent 18.4 % of the total population of New York state [1]. This population is considered a priority to the New York State Department of Health due to disparate health outcomes measured at the state level including premature death rates, unintended pregnancy, occupational lead poisoning, asthma prevalence, HIV/AIDS mortality, and the highest percentage of self-reported health and mental health as fair or poor and poor, respectively, as compared to other populations [2]. Hispanics/Latinos also experience disparities in education and income, with 25.2 % in New York state living below the poverty line in 2009 [2].

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While the Hispanic/Latino population has been increasing, interventions using eHealth technologies (such as the Internet) and mobile technologies (mHealth) such as text messages have also been gaining in popularity as a strategy to improve or enable health [3–5]. As an increasing number of studies are published, more is known about the effectiveness of such interventions. Reviews of eHealth and mHealth interventions, including those using text messages and social media, seem to concur that while many interventions have shown initial successes, more work is needed to better develop recommendations for best practices [6–10]. Long-term follow-up, community engaged research, and cost effectiveness assessment are just some of the recommendations for future work. For eHealth interventions to be successful, though, the target population must have access to the technology and be willing to use the technology for health purposes; otherwise, these interventions can lead to greater disparities [11].

Although earlier data suggested there was a significant digital divide for Hispanics/Latinos compared to whites and blacks [12], recent national data suggest that Hispanics/Latinos now use the Internet at only slightly lower rates (76 %) compared to white non-Hispanics (86 %) and black non-Hispanics (85 %) [13]. Other research suggest that Hispanics/Latinos own cell phones, including smartphones [14], and go online from a mobile device [15] at similar and sometimes higher rates than other racial and ethnic groups.

With respect to health information seeking online, a study published in 2013 found that Hispanic young women accessing services at reproductive health clinics were less likely to access the Internet from home and to search for health information than whites [16], and a 2012 national Pew study found that Hispanics/Latinos were less likely than non-Hispanic whites and blacks to search for a medical diagnosis online [17]. However, a study using 2007 national data found that education and income were bigger predictors of health information seeking than race or ethnicity [18].

While some information is available about Hispanic/Latino use of technology for health information, much of it is outdated, and there is a dearth of information about Internet and cell phone use, as well as health information-seeking patterns, among Hispanics/Latinos, especially at the state level. In order to determine the tools and channels that may be most effective for state health departments to reach the Hispanic/Latino population, it is necessary to understand state-level access and usage. The New York State Department of Health Office of Minority Health and Health Disparities Prevention (OMH-HDP), in partnership with the University at Albany School of Public Health and Bassett Research Institute, developed the New York State Media and Technology Use Survey. The aim of the survey was to describe technology use, health information-seeking patterns, and preferences for receiving health information for a sample of New York state (NYS)

residents with oversampling of rural and Hispanic/Latino populations to facilitate future analyses of these subgroups.

Across-group comparisons, presented elsewhere, suggested few differences in technology access and activities using technology with one exception; although Hispanics/Latinos were less likely to have a cell phone than non-Hispanics/Latinos (83 vs. 91 %), use was still widespread [19].

Hispanics/Latinos were more likely than non-Hispanics/Latinos to indicate they would prefer to receive information from a health organization such as the Department of Health (DOH) via phone apps and social networking sites [19]. More traditional media channels of television and mail were also more highly rated by Hispanics/Latinos, suggesting there could be important differences to consider.

In order to evaluate differences within Hispanics/Latinos, this paper focuses specifically on the Hispanic/Latino respondents by addressing the following questions.

Research question 1 What is the level of access to digital technologies including computers, the Internet, cell phones, smartphones, and texting among Hispanics/Latinos in New York?

Research question 2 What is the frequency of engaging in various Internet and cell phone activities among Hispanics/Latinos in New York?

Research question 3 What channels are preferred for receiving health information among Hispanics/Latinos in New York?

Methods

The New York State Media and Technology Use Survey was a cross-sectional telephone survey of a sample of NYS residents, ages 18 years and older. It was created to assess the media and technology access of NYS residents, along with health information-seeking patterns and preferences. Participants could be interviewed in either English or Spanish. IRB approval was obtained through the University at Albany Office of Regulatory and Research Compliance. This study was considered exempt from full review. More detailed information regarding the survey and sample, and a more complete description of questions asked, are provided elsewhere [19].

Sample

Siena Research Institute purchased phone number lists generated using a random digit dialing methodology from Survey Sampling International (SSI). Random digit dialing was used for the landline sample to ensure selection of both listed and unlisted telephone numbers, whereas the cell phone sample

was retrieved from dedicated wireless telephone exchanges from within NYS. To ensure a sufficient number of rural respondents, a component of the landline sample targeted the 24 NYS counties not situated in a metropolitan statistical area. Oversampling of Hispanic/Latino respondents was also accomplished through targeted random sampling. SSI correlated the probability of ethnic density of census tracts for Hispanics to exchanges. Each US directory-listed telephone household was assigned a density code reflecting the probability of Hispanic households for the census tract in which the household resides. SSI calculated an average of all the directory-listed telephone households in the exchange to estimate the probability of reaching a Hispanic household in that exchange. Telephone numbers were drawn from exchanges known to have at least a 20 % concentration of Hispanic residents. This sample included 11 counties in New York: Bronx, Kings, Monroe, Nassau, New York, Orange, Queens, Richmond, Rockland, Suffolk, and Westchester.

The sampling plan from these multiple frames produced an overall study population of 1350 adults, with 483 identified through their cell phones. Hispanics/Latinos were identified using the question ‘Are you of Hispanic, Latino, or Spanish origin?’ with the following response choices: No, not of Hispanic, Latino, or Spanish origin; Yes, Mexican, Mexican American, Chicano/a; Yes, Puerto Rican; Yes, Cuban; Yes, another Hispanic, Latino, or Spanish origin (specify). This paper mainly reports on data from the 412 Hispanics/Latinos in the sample. Of these, 332 were completed via landline and 80 were completed via cell phone. Of the 332 completed on a landline telephone, 24 came from the representative statewide-specified subsample, 9 came from the specified subsample of rural areas, and 299 came from a targeted Hispanic sample. The 412 completed interviews included 333 conducted in English and 79 conducted in Spanish. Based on frequencies related to origin, four groups were created for analysis: Mexican, Puerto Rican, Dominican, and other.

Measures

The survey asked for demographic information such as geographic area (urban vs. suburban/rural), age, race, ethnicity (described above), sex, education level, employment status, income, number and ages of children, health insurance coverage, and number of doctor visits within the last year.

Questions on media and technology access and use included questions about the number of working computers in the home, type of Internet access on these computer(s), cell phone service, whether their cell phone was a smartphone, and on what device the Internet is typically accessed. Questions about frequency of engaging in a number of cell phone and Internet activities were also asked, such as sending or receiving email, visiting a social networking site, and receiving or sending a text message on a cell phone. Answer choices were *several*

times a day, once a day, several times a week, once a week, less than once a week, and never.

Respondents were also asked about preferences for receiving health information (e.g., topics such as exercise, nutrition, immunizations, and where to find a healthcare provider) from an organization like the Department of Health (DOH). They rated their interest as low, medium, or high for communication channels including app for a cell phone, website, and television.

Analysis

Due to the complex sampling strategy, a weighted analysis was conducted utilizing Stata/SE. For this sample, weights were derived to adjust for the sampling procedures (which led to some individuals having greater or lesser probability of being included in the survey). This first-stage adjustment corrected for unequal probabilities of selection based on the number of adults in the household (for respondents with a landline), the overlap of the landline and cell frames (people with both a landline and cell phone have a greater probability of being included in the sample), and the presence of the targeted sampling frames (people who lived in rural areas or Hispanic-dense areas of the state have a greater probability of being included in the sample). This adjustment was based on the size of the sample dialed from each frame and size of the frames, as well as the number of adults in the household. A second stage of weighting was used to adjust the distribution of the sample’s sociodemographic characteristics to match the characteristics of the population of NYS Hispanic residents age 18 and over based on US Census data. Data were weighted for age, sex, region, urban status, and education. An iterative technique was used to derive the best fitting weight value that simultaneously considers all demographic variables. Chi-square tests were used to compare respondent groups for bivariate analyses. Logistic regression and ordinal logistic regression were used to run adjusted models that accounted for the following demographics: education, sex, age, language of interview, Hispanic group, race, income, and geographic area.

Results

Table 1 provides data regarding the total sample from the survey including Hispanics/Latinos and percentages specifically for the Hispanic/Latino respondents. The Hispanic/Latino respondents surveyed skewed younger and were more likely to live in urban areas. Hispanics/Latinos were also more likely to have fewer years of education and be in lower income brackets and to select ‘other’ for race.

Table 1 Demographic comparisons between total survey sample including Hispanics/Latinos and Hispanics/Latinos only (weighted estimates)

	Total sample (<i>n</i> =1350)	Hispanic/Latino only (<i>n</i> =412)	Took survey in English (<i>n</i> =333)	Took survey in Spanish (<i>n</i> =79)
Education				
High school graduate or less	35 %	51 %	44 %	78 %
Some college/vocational degree	31 %	30 %	34 %	13 %
College graduate or more	35 %	20 %	22 %	8 %
Age				
18–29	23 %	30 %	35 %	9 %
30–49	36 %	39 %	37 %	46 %
50–59	17 %	14 %	13 %	19 %
60 or over	25 %	17 %	14 %	27 %
Sex				
Male	48 %	49 %	53 %	34 %
Female	52 %	51 %	47 %	66 %
Hispanic, Latino/a, or Spanish origin—Yes				
Hispanic/Latino group	17 %	100 %	100 %	100 %
Mexican		10 %	9 %	16 %
Puerto Rican		34 %	39 %	12 %
Dominican		22 %	16 %	44 %
Other		34 %	36 %	28 %
Race				
White	65 %	37 %	35 %	42 %
Black/African American	16 %	11 %	13 %	4 %
Asian	8 %	7 %	7 %	10 %
Other	10 %	45 %	45 %	45 %
Household income				
Less than \$25,000	26 %	41 %	35 %	66 %
\$25,000 to \$49,999	18 %	18 %	21 %	3 %
\$50,000 to \$74,999	12 %	8 %	10 %	0 %
\$75,000 or more	23 %	15 %	18 %	1 %
Missing	21 %	19 %	16 %	30 %
Geographic area				
Suburban or rural	33 %	22 %	24 %	14 %
City/urban	56 %	78 %	76 %	86 %

Research Question 1 *What is the level of access to digital technologies including computers, the Internet, cell phones, smart phones, and texting among Hispanics/Latinos in New York?*

A substantial portion of Hispanics/Latinos reported having at least one working computer at home (78 %) and most reported using the Internet (84 %). Of those with a computer, 90 % reported having high-speed Internet service (69 % of all respondents). Cell phone ownership was fairly common with 88 % of respondents indicating they had a cell phone. Most had unlimited texting (78 %), and many had a smartphone (71 %). Table 2 shows that most differences were due to age; older respondents were significantly less likely to have each of the technologies. Income was also an important predictor primarily for

smartphones; in general, access was high across all income groups. In addition, college graduates were more likely to have computers at home, and those who completed the survey in Spanish were less likely to have broadband access at home. Sex, origin, race, and geographic area did not independently contribute to differences, with the exception that Hispanics/Latinos living in urban areas were more likely to have broadband access.

Research Question 2 *What is the frequency of engaging in various Internet and phone activities among Hispanics/Latinos in New York?*

The most common activities occurring several times per day were sending text messages (61 %), using phone apps (49 %), using a search engine (40 %), using email (34 %), and using

Table 2 Internet and cell phone use and access for Hispanic/Latino New York state respondents ($n=412$ except where noted) (weighted estimates, unadjusted, and adjusted using logistic regression)^a

	Percentage with working computer at home	Percentage with broadband access at home ($n=325$)	Percentage who have cell phone	Percentage who have unlimited texting ($n=358$)	Percentage who have smartphone ($n=358$)
Education	$p<.0001$	$p<.0001$	$p=.0169$		$p=.0285$
High school graduate or less	68 %	81 %	83 %	75 %	65 %
Some college/vocational degree	85 %	98 %	89 %	83 %	82 %
College graduate or more	95 %**	96 %*	95 %	76 %	71 %
Age	$p<.0001$	$p=.001$	$p=.0045$	$p=.0109$	$p<.0001$
18–29	91 %	96 %	92 %	89 %	86 %
30–49	79 %*	91 %	88 %	74 %**	74 %*
50–59	79 %	87 %	92 %	78 %	64 %*
60 or over	50 %***	66 %**	75 %**	63 %**	36 %***
Sex	$p=.0996$				$p=.0040$
Female	74 %	86 %	85 %	78 %	62 %
Male	82 %	92 %	91 %	78 %	79 %
Completed survey in Spanish	$p=.0023$	$p<.0001$	$p=.0160$		$p=.0040$
No	81 %	95 %	90 %	79 %	75 %
Yes	63 %	63 %***	79 %	74 %	53 %
Hispanic/Latino group					
Mexican	75 %	78 %	82 %	78 %	71 %
Puerto Rican	72 %	90 %	87 %	82 %	74 %
Dominican	83 %	92 %	88 %	83 %	78 %
Other	81 %	91 %	89 %	72 %	64 %
Race					
White	74 %	87 %	91 %	73 %	67 %
Black/African American	84 %	92 %	85 %	85 %	80 %
Asian	79 %	74 %	82 %	82 %	66 %
Other	77 %	91 %	87 %	79 %	73 %
Household income	$p=.0001$	$p=.1023$	$p=.0114$		$p=.0005$
Less than \$25,000	70 %	84 %	84 %	78 %	61 %
\$25,000 to \$49,999	85 %	98 %	92 %	81 %	88 %**
\$50,000 to \$74,999	89 %	84 %	96 %	89 %	80 %**
\$75,000 or more	99 %**	97 %	98 %*	74 %	85 %**
Missing	67 %	85 %	81 %	73 %	59 %
Geographic area					
Suburban or rural	83 %	85 %	91 %	79 %	70 %
Urban	76 %	91 %**	86 %	78 %	71 %

The reference group is the first group listed for each demographic characteristic

* $p<.05$; ** $p<.01$; *** $p<.0001$; adjusted p values of significance

^aUnadjusted p values of significance are indicated in the table

social networking sites (32 %). Table 3 provides data on nonusers (responded ‘never’) of Internet and technology activities in the sample. Because 84 % reported never using Twitter, and 88 % reported never using online bulletin boards like Pinterest, these activities are not included in the table. In general, age is the most significant predictor of differences across activity use, with older adults being more likely to report ‘never’ doing most activities compared to younger adults. Education

was also a significant predictor; those with high school education or less were less likely to use the Internet, email, search engines, online videos, and smartphone apps and were less likely to read newspapers and magazines online. Hispanics/Latinos with higher incomes were more likely to use smartphone apps, but less likely to use health-related smartphone apps. As with technology access, sex, survey language, origin, and race did not independently contribute to differences in activities.

Table 3 Frequency of internet- and phone-related activities for Hispanic/Latino New York state respondents ($n=412$) (weighted estimates, unadjusted, and adjusted using ordinal logistic regression)^a

	Internet use: never	Email: never	Search engine: never	Read news/mags: never	SNS: never	SNS for health: never	Use videos: never	Video chat: never	Texts: never	Apps: never	Health apps: never
Education	$p<.0001$	$p<.0001$	$p<.0001$	$p<.0001$	$p=.0077$		$p=.0001$	$p<.0001$	$p=.0049$	$p<.0001$	
High school graduate or less	29 %	38 %	34 %	66 %	46 %	53 %	48 %	75 %	17 %	40 %	54 %
Some college/vocational degree	4 %***	14 %***	8 %***	38 %*	25 %	59 %	30 %	57 %	5 %	17 %*	44 %*
College graduate or more	4 %**	9 %***	4 %***	32 %**	30 %	71 %	21 %*	39 %***	9 %	9 %**	62 %
Age	$p<.0001$	$p<.0001$	$p<.0001$	$p<.0001$	$p<.0001$	$p=.0008$	$p<.0001$	$p<.0001$	$p<.0001$	$p<.0001$	
18–29	3 %	10 %	3 %	36 %	15 %	68 %	15 %	49 %	1 %	8 %	47 %
30–49	10 %**	22 %	15 %***	48 %*	32 %***	52 %*	32 %***	58 %*	5 %***	25 %***	54 %
50–59	21 %***	28 %	27 %***	64 %*	46 %***	74 %*	47 %***	74 %**	21 %***	46 %***	61 %
60 or over	50 %***	60 %***	61 %***	77 %***	76 %***	33 %**	81 %***	88 %***	40 %***	67 %***	64 %
Sex				$p=.0372$							
Female	20 %	30 %	26 %	57 %	38 %	59 %	41 %	65 %	15 %	31 %	51 %
Male	13 %	21 %	16 %	46 %	34 %	60 %	34 %	61 %	7 %	23 %	53 %
Completed survey in Spanish	$p<.0001$	$p<.0001$	$p<.0001$	$p=.0027$	$p=.0920$		$p<.0001$	$p=.0016$	$p=.0781$	$p<.0001$	
No	12 %	20 %	14 %	47 %	34 %	60 %	30 %	58 %	9 %	20 %	49 %
Yes	33 %	49 %	49 %	71 %	46 %	56 %	65 %	81 %	21 %	63 %	53 %
Hispanic/Latino group					$p=.0116$				$p=.0006$		
Mexican	15 %	32 %	21 %	49 %	32 %	56 %	39 %	64 %	6 %	15 %	64 %
Puerto Rican	22 %	30 %	27 %	57 %	39 %	60 %	39 %	67 %	16 %	31 %	56 %
Dominican	14 %	23 %	19 %	55 %	29 %	58 %	38 %	65 %	9 %*	28 %	54 %
Other	13 %	21 %	17 %	45 %	40 %	61 %	38 %	57 %	10 %	26 %	43 %
Race											
White	20 %	33 %	25 %	54 %	45 %	55 %	41 %	63 %	12 %	27 %	55 %
Black/African American	7 %	16 %	12 %	40 %	20 %	62 %	32 %	60 %	14 %	20 %	46 %
Asian	18 %	27 %	24 %	50 %	50 %	49 %	51 %	67 %	18 %	30 %	49 %
Other	17 %	24 %	22 %	53 %	33 %	65 %	34 %	59 %	10 %*	29 %	52 %
Household income	$p<.0001$	$p<.0001$	$p<.0001$	$p=.0505$			$p<.0001$	$p=.0002$	$p=.0012$	$p<.0001$	$p=.0901$
Less than \$25,000	23 %	32 %	33 %	59 %	44 %	48 %	51 %	72 %	16 %	39 %	38 %
\$25,000 to \$49,999	6 %	22 %	7 %*	46 %	25 %*	69 %***	24 %**	55 %	3 %***	19 %*	50 %
\$50,000 to \$74,999	4 %	20 %	3 %	50 %	35 %	66 %	11 %**	63 %	5 %	13 %	67 %*
\$75,000 or more	1 %*	3 %**	1 %*	32 %	26 %	69 %	19 %	36 %	3 %***	6 %***	66 %*
Missing	30 %	35 %	32 %	57 %	40 %	61 %	45 %	70 %	22 %	39 %	62 %***
Geographic area											
Suburban or rural	9 %	23 %	10 %	45 %	34 %	69 %	29 %	58 %	8 %	25 %*	50 %
Urban	19 %	27 %	24 %	54 %	38 %	56 %	40 %	65 %	12 %	28 %	53 %

Reference group is the first group listed for each demographic characteristic

* $p<.05$; ** $p<.01$; *** $p<.0001$; adjusted p values of significance

^aUnadjusted p values of significance are indicated in the table

Research Question 3 *What channels are preferred for receiving health information among Hispanics/Latinos in New York?*

When asked about receiving health information from an organization, many people reported a ‘high’ preference for websites (47 %). After websites, the next most preferred channels were mail (e.g., brochure) (43 %) and television (41 %). Email and phone apps were both rated ‘high’ by 34 % of respondents. Text messages followed closely with 32 %, which was followed by in-person meetings at 31 %. Table 4 shows that geographic area, origin, and race did not predict any differences in preferences. Income also did not appear to play a role. Those who completed the survey in Spanish were more likely to prefer text messages as a way to receive health information, and college graduates were significantly more likely to prefer websites. Females were more likely to prefer mail. The most significant predictor of preference differences was age; people in older age groups were less likely to prefer newer forms of information dissemination (websites, email, smartphone apps, texts, and SNS).

Discussion

This study showed that among Hispanics/Latinos in New York, technology use and access was quite high and is reasonably comparable to national data, with some differences. NYS Hispanic/Latino adults were more likely to have one or more working computers at home (78 % NYS vs. 70 % national) [20] and greater access to high-speed Internet (69 vs. 53 %) [21]. Furthermore, Internet use was higher for Hispanics/Latinos in NYS (84 vs. 76 %) [13] as was Internet use for health information (70 vs. 48 %) [17]. Although NYS Hispanic/Latino adults were slightly less likely to own a cell phone (88 vs. 92 %), they were more likely to own a smartphone (71 vs. 61 %) [22]. NYS rates were lower for use of social networking sites (64 vs. 70 %) [23] but similar for sending text messages (89 vs. 87 %) [24] among Hispanics/Latinos. As reported in the [Background](#), results were comparable to those of non-Hispanics/Latinos in NYS [19].

In prior research, language has been an important determinant of home computer and Internet access and use. Spanish-speaking Hispanics/Latinos traditionally have had lower rates of computer ownership and home Internet access [25]. In 2012, 89 % of Hispanics/Latinos who predominately spoke English used the Internet compared to 63 % of those reporting Spanish dominance ([26]; Fig. 3). In this sample, few differences by language were seen; those who completed the survey in Spanish were less likely to have broadband access and were slightly more likely to prefer receiving health information via text messages or social networking sites. Although few differences exist in technology access and use by language, it is important to consider that the presentation of health

information itself must account for language differences. For instance, a study of oncology websites found that rising numbers of Spanish speakers accessing oncology websites are faced with a lack of Spanish resources on such sites [27].

Regarding technology access and use, we saw no significant differences by ethnic group (i.e., whether the respondent was Mexican or Puerto Rican). According to Pew, ethnic differences disappear when education and income are controlled for [28]. Age, income, and education appear to be the main factors that distinguish Internet and technology use in national studies [13, 14], and our findings comparing Hispanics/Latinos with non-Hispanics/Latinos in New York are consistent with these national reports [19]; almost no differences by ethnicity (Hispanic vs. non-Hispanic) for access to technologies and activities using technologies were seen.

A nationally representative study conducted in 2007 of 4013 Hispanic/Latino adults found that Hispanics/Latinos reported they received health-related information in the past year from a medical professional (71 %), television (69 %), family or friends (63 %), newspapers and magazines (51 %), radio (40 %), and the Internet (35 %) [29]. However, Internet use has significantly increased since then, which has translated to greater reliance on the Internet for health information. In our study, when asking about preferred channels for receiving health information from an organization, websites, mail, and TV were the top three choices. As reported in the results, not all groups preferred a website; older Hispanics/Latinos and those with lower education levels were much less likely to prefer websites. Given this, it is important that organizations with websites supplement information dissemination with other channels. Also of note is that those who completed the survey in Spanish had a stronger preference for text messages. This may be due to the limited content involved with this form of communication.

It was not surprising that older respondents were much less likely to indicate a high preference for email, text messages, smartphone apps, and social networking sites as a way to get health information. Some research has shown that older adults believe that technology has many positive attributes and provide a myriad of reasons for not using certain technologies [30]. Some include a lack of knowledge about how to use certain technologies. Thus, future interventions may consider helping to improve skills related to using newer technologies and how they can be used to promote health.

As stated in the [Background](#), prior analyses found that Hispanics/Latinos were more likely than non-Hispanics/Latinos to prefer TV, mail, social networking sites, and smartphone apps for receiving health information from an organization [19]. Further exploration of these findings is needed to better understand why and whether there are differences based on information types (i.e., nutrition vs. asthma).

While this study presents important findings, potential methodological limitations should be considered. With respect

Table 4 Preferred media channels for receiving health information for Hispanic/Latino New York state respondents ($n=412$) (weighted estimates, unadjusted, and adjusted using ordinal logistic regression)^a

	Website: high	TV: high	Mail: high	Email: high	In-person: high	Phone app: high	Text: high	Radio: high	SNS: high
Education	$p<.0001$			$p=.0596$					
High school graduate or less	35 %	45 %	43 %	30 %	31 %	31 %	33 %	21 %	24 %
Some college/vocational degree	52 %*	39 %	46 %	36 %	32 %	38 %	34 %	21 %	32 %
College graduate or more	72 %***	36 %	38 %	43 %	32 %	34 %	21 %	25 %	22 %
Age	$p<.0001$			$p<.0001$		$p=.0001$	$p=.0048$	$p=.0045$	$p=.0031$
18–29	56 %	37 %	37 %	36 %	30 %	49 %	36 %	14 %	34 %
30–49	49 %	46 %	42 %	40 %	32 %	36 %**	36 %	24 %	27 %
50–59	50 %	44 %	55 %**	36 %	28 %	23 %***	31 %	32 %	23 %*
60 or over	23 %***	36 %	47 %	15 %***	32 %	13 %***	14 %***	25 %	12 %***
Sex		$p=.0641$	$p=.0003$		$p=.0322$		$p=.1056$		
Female	46 %	45 %	52 %	35 %	31 %	36 %	31 %	22 %	29 %
Male	48 %	37 %	33 %**	33 %	31 %	33 %	32 %	22 %	22 %
Completed survey in Spanish	$p=.0007$			$p=.0039$			$p=.0237$		$p=.0711$
No	52 %	41 %	44 %	36 %	31 %	36 %	29 %	22 %	26 %
Yes	28 %	41 %	38 %*	24 %	31 %	29 %	40 %*	24 %	26 %
Hispanic/Latino group							$p=.0472$		
Mexican	46 %	52 %	48 %	33 %	26 %	34 %	49 %	30 %	33 %
Puerto Rican	47 %	36 %	42 %	27 %	31 %	34 %	27 %	20 %*	20 %
Dominican	53 %	47 %	45 %	39 %	35 %	38 %	36 %	20 %	33 %
Other	43 %	40 %	41 %	37 %	31 %	31 %	28 %	24 %	26 %
Race	$p=.0890$								$p=.0640$
White	41 %	40 %	45 %	28 %	30 %	28 %	23 %	19 %	22 %
Black/African American	64 %	41 %	37 %	49 %	31 %	35 %	29 %	26 %	28 %
Asian	33 %	41 %	42 %	22 %	38 %	25 %	39 %	10 %	4 %*
Other	48 %	44 %	44 %	37 %	31 %	38 %	37 %	26 %	32 %
Household income	$p=.0108$			$p=.0433$					
Less than \$25,000	38 %	44 %	45 %	32 %	29 %	33 %	33 %	23 %	27 %
\$25,000 to \$49,999	52 %	46 %	52 %	39 %	30 %	46 %	34 %	18 %	35 %
\$50,000 to \$74,999	44 %	25 %	33 %	24 %	35 %	29 %	16 %	24 %	23 %
\$75,000 or more	77 %	34 %	30 %	51 %	26 %	34 %	27 %	34 %	22 %
Missing	40 %	42 %	44 %	24 %	38 %	29 %	35 %	16 %	19 %
Geographic area									
Suburban or rural	50 %	40 %	33 %	28 %	31 %	36 %	26 %	17 %	21 %
Urban	47 %	42 %	46 %	36 %	31 %	34 %	33 %	24 %	27 %

Reference group is the first group listed for each demographic characteristic

* $p<.05$; ** $p<.01$; *** $p<.0001$; adjusted p values of significance

^a Unadjusted p values of significance are indicated in the table

to sampling, the validity of results was supported by employing sampling frames for both landlines and cell phones and using a random process for sampling phone numbers. Sampling weights were derived to correct for the complex sampling design and to align the study population with the sociodemographic composition of the adult NYS Hispanic/Latino population, thereby compensating for different levels of participation by sociodemographic subgroups. Nativity plays an important role in technology access and use, but it

was not asked in this survey. For instance, other studies have shown that native-born Hispanics/Latinos have higher rates of Internet use and broadband service compared to those born outside of the US ([26]; Fig. 3). However, in these analyses, whether the respondent completed the survey in English or in Spanish was included. In addition, some percentage differences may not be statistically significant but may still indicate meaningful differences in the population. This study may not have had enough power for some of the characteristic comparisons

since the sample size for the overall survey was based on having the ability to compare Hispanics/Latinos with other race and ethnic groups in the total NY sample. Finally, data were collected in 2013. As technology use trends can change quickly, there may already be new trends that are not captured here.

In an essay about eHealth interventions for Latino populations, Victorson and colleagues explain how “health care access, need for English language proficiency, nationality and acculturation status, and attitudes and beliefs about illness and medical professionals” (p.2259) can all have an impact on health information-seeking behavior [31]. Given the diversity among Hispanics/Latinos, there are cultural and linguistic nuances which must be accounted for in the development and dissemination of health messages [31]. Although age and education seemed to be the main predictors of technology access and use, while race, ethnic group, and survey language did not seem to have an influence, it is important to remember that *how* these technologies are used may differ across sub-groups of Hispanics/Latinos. As an example, a study cited above found that “Spanish-speaking oncology readers differ from English-speaking readers in day and time of Internet browsing, visit duration, Internet search patterns, and types of cancers searched” (p.1) [27]. Details of use, such as time of day or specific websites or apps used was not asked about; further work is needed to better understand potential differences in the details of how the technologies are utilized for health purposes.

These findings have direct implications for OMH-HDP and the New York State Department of Health (NYSDOH) as a whole in its efforts to deliver health messaging to Hispanic/Latino communities. In considering its mode for messaging, NYSDOH needs to look to the use of technology-based health communications, including web-based social media and smartphone applications. Policies need to be developed with sensitivity to the differences among diverse Hispanic/Latino groups. Data derived from this research could be used to segment the population, so that communication campaigns, such as those for emergency preparedness, can be developed and targeted to different groups, using the most appropriate communications channels, including text messaging. Information from these findings should be disseminated within the entire agency and even other health-related state agencies, as well as to contractors working to develop communications for the Hispanic/Latino population.

Understanding preferences for receiving health information is critical in the design and implementation of outreach efforts at the state level, especially for the growing Hispanic/Latino population. This information can inform policy development and program planning, has the potential to increase reach and impact, and improve health outcomes among the diverse populations. Continuing to explore communication strategies, from a recipient’s perspective, will ensure that organizations are equipped to provide critical health messages to those they serve.

Compliance with Ethical Standards

Funding This research was funded by the New York State Department of Health, Office of Minority Health, and Health Disparities Prevention.

Conflict of Interest Author 1 received salary support from the funder to lead the study. Authors 2, 3, and 4 work for the funder. Author 5 has no conflict of interest to disclose.

Informed Consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Informed consent was not obtained because this study was considered exempt by the IRB.

References

1. U S Census Bureau. Comparative demographic estimates: 2013 American community survey 1-year estimates. 2013. http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_1YR_CP05&prodType=table.
2. New York State Department of Health. New York State minority health surveillance report. 2012. http://www.health.ny.gov/statistics/community/minority/docs/surveillance_report_2012.pdf.
3. Eng TR. The eHealth landscape: a terrain map of emerging information and communication technologies in health and health care. The Robert Wood Johnson Foundation: Princeton; 2001.
4. Korda H, Itani Z. Harnessing social media for health promotion and behavior change. *Health Promot Pract*. 2013;14(1):15–23.
5. Neiger BL, Thackeray R, Van Wagenen SA, Hanson CL, West JH, Barnes MD, et al. Use of social media in health promotion: purposes, key performance indicators, and evaluation metrics. *Health Promot Pract*. 2012;13(2):159–64.
6. Clar C, Dyakova M, Curtis K, Dawson C, Donnelly P, Knifton L, et al. Just telling and selling: current limitations in the use of digital media in public health: a scoping review. *Pub Health*. 2014;128(12):1066–75. doi:10.1016/j.puhe.2014.09.009.
7. Hall AK, Cole-Lewis H, Bernhardt JM. Mobile text messaging for health: a systematic review of reviews. *Annu Rev Public Health*. 2015;36:393–415. doi:10.1146/annurev-publhealth-031914-122855.
8. Naslund JA, Marsch LA, McHugo GJ, Bartels SJ. Emerging mHealth and eHealth interventions for serious mental illness: a review of the literature. *J Ment Health*. 2015:1–12. doi:10.3109/09638237.2015.1019054.
9. Odone A, Ferrari A, Spagnoli F, Visciarelli S, Shefer A, Pasquarella C, et al. Effectiveness of interventions that apply new media to improve vaccine uptake and vaccine coverage. *Hum Vaccin Immunother*. 2014;11(1):72–82. doi:10.4161/hv.34313.
10. Yonker LM, Zan S, Scirica CV, Jethwani K, Kinane TB. “Friending” teens: systematic review of social media in adolescent and young adult health care. *J Med Internet Res*. 2015;17(1):e4. doi:10.2196/jmir.3692.
11. McAuley A. Digital health interventions: widening access or widening inequalities? *Pub Health*. 2014;128(12):1118–20. doi:10.1016/j.puhe.2014.10.008.
12. Wang J, Bennett K, Probst J. Subdividing the digital divide: differences in internet access and use among rural residents with medical limitations. *J Med Internet Res*. 2011;13(1):e25.
13. Zickuhr K. Who’s not online and why. Pew Research Internet Project; 2013.

14. Fox S, Rainie L. The web at 25 in the U.S.: how the internet has woven itself into American life. Pew research center; 2014.
15. Duggan M, Smith A. Social media update 2013. Pew Research Center; 2013.
16. Laz TH, Berenson AB. Racial and ethnic disparities in internet use for seeking health information among young women. *J Health Commun.* 2013;18(2):250–60. doi:10.1080/10810730.2012.707292.
17. Fox S, Duggan M. Health online 2013. 2013. http://www.pewinternet.org/files/old-media/Files/Reports/PIP_HealthOnline.pdf.
18. Richardson A, Allen JA, Xiao H, Vallone D. Effects of race/ethnicity and socioeconomic status on health information-seeking, confidence, and trust. *J Health Care Poor Underserved.* 2012;23(4):1477–93.
19. Manganello J, Gerstner G, Pergolino K, Graham Y, Strogatz D. Media and technology access, use, and preferences for receiving health information among New York State residents. *JMIR Pub Health Surveill.* (forthcoming). doi:10.2196/publichealth.4442.
20. Smith A. Americans and their gadgets. Pew Research Center. 2010. <http://www.pewinternet.org/files/old-media/Files/Reports/2010/PIP-Americans%20and%20their%20Gadgets.pdf>.
21. Zickuhr K, Smith A. Home broadband. Pew Research Internet Project; 2013.
22. Pew Research Internet Project. Cell phone and smartphone ownership demographics. 2014.
23. Pew Research Internet Project. Social media user demographics. 2014. <http://www.pewinternet.org/data-trend/social-media/social-media-user-demographics/>.
24. Duggan M. Cell phone activities. Pew. 2013. http://www.pewinternet.org/files/old-media/Files/Reports/2013/PIP_Cell%20Phone%20Activities%20May%202013.pdf.
25. Fairlie R. Is there a digital divide ethnic and racial differences in access to technology and possible explanations. Patio Policy Institute and California Policy Research Center; 2003. http://cjitc.ucsc.edu/docs/r_techreport5.pdf.
26. Lopez MH, Gonzalez-Barrera A, Patten E. Closing the digital divide: Latinos and technology adoption. 2013. <http://www.pewhispanic.org/2013/03/07/closing-the-digital-divide-latinos-and-technology-adoption/>.
27. Simone CB, Hampshire MK, Vachani C, Metz JM. The utilization of oncology Web-based resources in Spanish-speaking internet users. *Am J Clin Oncol.* 2012;35(6):520–6. doi:10.1097/COC.0b013e31821d4906.
28. Livingston G. Latinos and digital technology, 2010. 2011. <http://www.pewhispanic.org/2011/02/09/latinos-and-digital-technology-2010/>.
29. Livingston G, Minushkin S, Cohn D. Hispanics and health care in the United States: access, information and knowledge. Washington, DC: Pew Hispanic Center & Robert Wood Johnson Foundation; 2008.
30. Mitzner TL, Boron JB, Fausset CB, Adams AE, Charness N, Czaja SJ, et al. Older adults talk technology: technology usage and attitudes. *Comput Hum Behav.* 2010;26(6):1710–21. doi:10.1016/j.chb.2010.06.020.
31. Victorson D, Banas J, Smith J, Languido L, Shen E, Gutierrez S, et al. ESalud: designing and implementing culturally competent eHealth research with Latino patient populations. *Am J Public Health.* 2014;104(12):2259–65. doi:10.2105/AJPH.2014.302187.