

Article

Adolescent and parent use of new technologies for health communication: a study in an urban Latino community

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Significance for public health

Communication technologies provide novel opportunities to support clinic-based health initiatives for underserved youth. However, adoption of technologies among communities may differ depending upon demographic and cultural characteristics. We surveyed a sample of urban Latino parents and youth regarding their current use of mobile and social media technologies and preferences for use of these technologies for health communication. This is the first study to compare the perspective of underserved parents and their youth regarding use of a wide variety of mobile and social communication technologies, concordance between youth-parent pairs in perceived use of texting and preferences for the purpose of health communication. Our findings differ from those from adults surveyed in other underserved communities, highlighting heterogeneity between communities. Variations in use of communication technologies and social media and preferences between parent-youth pairs suggest that understanding these factors within target populations is crucial for successful use to support health and health services.

Abstract

Background. Mobile communication technologies provide novel opportunities to support clinic-based health initiatives. Adoption of technologies for daily use and for health communication can differ between communities, depending upon demographic and cultural characteristics.

Design and methods. A survey was administered in adolescent primary care and subspecialty clinics to assess parent-adolescent preferences in use of mobile technologies and social media to support provider-patient communication in an urban Latino community.

Results. Of 130 respondents (65 parent-adolescent pairs), approximately half frequently sent and received text messages but lacked agreement regarding the other's text messaging use. In contrast, adolescents only rarely used email compared to parents (15.4% versus 37.5%, $P=0.006$). Of social media, Facebook™/MySpace™ was most frequently used by parents and youth (60% and 55.4%, $P=0.59$); however, most lacked interest in using social media for health communication. Parents reported more interest than adolescents in receiving email (73.4% versus 35.9%, $P<0.001$) and text messages (58.5% versus 33.9%, $P=0.005$) for health, but had more concerns about privacy issues (26.2% versus 9.2%, $P=0.01$). Respondents who were American born (aOR 5.7, 95%CI 1.2-28.5) or regularly used Instant Messaging or Facebook™/MySpace™ (aOR 4.6, 95%CI 1.4-14.7) were more likely to be interested in using social media for health communication.

Conclusions. These findings underscore the importance of targeted assessment for planning the utilization of communication technologies and social media in clinical care or research for underserved youth.

Introduction

Mobile communication technologies provide novel opportunities to support clinic-based health initiatives.¹⁻⁵ Opportunities include sending appointment reminders,⁶⁻⁸ distributing laboratory reports or medical alerts,^{9,10} reminding parents about vaccination¹¹⁻¹³ and medication use.¹⁴ Mobile technologies and social media offer advantages of efficiencies of access, personalization, real-time communication and scaled-up dissemination.¹⁵⁻¹⁷ Text messaging is the primary modality being assessed for communicating with adolescents about self-management of chronic health conditions such as diabetes and asthma.^{4,17-20}

National surveys have described the burgeoning use of electronic technologies among teens in the United States, focused primarily on use of the Internet, cell phone and text messaging and Facebook™.^{21,22} Use of newer technologies has not been broadly assessed. Adoption of technologies for daily use and for health communication may differ between communities, depending upon demographic characteristics such as age, education, socio-economic level, language and cultural factors.^{15,23,24} Variable use of these technologies may stem from varying degrees of interest, access to or familiarity with the technologies and access to the supporting Internet-based infrastructure and privacy concerns. For health programs seeking to jointly engage both parents and their adolescents about health issues, pairs may differ in their familiarity with mobile communication, receptivity to its use for health issues and knowledge about the other's interest or ability to use these technologies.

To assess these issues in an urban, underserved, largely Latino community targeted for improving teen health, we surveyed youth and parent pairs recruited from multiple general and sub-specialty paediatric clinics. The purpose of this study was to assess: i) current use of mobile electronic technologies and social media among youth and their parents and appeal of use for electronic communication about health issues; and ii) concordance within parent-youth pairs in perception of the other's daily use of technology.

Design and methods

This study was conducted during July to November 2012 using a protocol approved by the Institutional Review Board of Columbia University. In lieu of written consent, an oral script was used to provide the study description to potential subjects and to obtain anonymous parent and youth verbal consent for survey participation. A 49 item bilingual survey was developed and formatted for a 6th grade reading level,^{25,26} and was piloted by several adolescents from the target community. Survey questions included demographic characteristics, daily use of cell phone, Internet, email, social media [Twitter™, Facebook™/MySpace™,

Instant Messaging (AIM™/iChat™) and Videoconferencing (Skype™/Oovoo™), pairs' perceptions of text messaging use of the other, and current use and future appeal of using each of these technologies for communicating health information. All survey items were categorical variables. Questions regarding frequency of current use of various technologies were categorized as never, rarely, sometimes, often and *I don't know*. Questions regarding interest in use of technology for health were categorized as *Yes*, *No* and *I don't know*.

A convenience sample of youth-parent pairs was recruited from general and multiple sub-specialty paediatric clinics affiliated with Columbia University Medical Center in northern Manhattan, USA, the major local health care facility. The community is predominantly of Caribbean Latino descent, with high rates of immigrants and poverty. Youth ages 10-17 years and their parents or guardians were approached in clinic waiting rooms and offered an anonymous self-administered close-ended survey, with choice of survey completion in English or Spanish. All potentially eligible subjects were approached consecutively by study staff in clinic waiting rooms. Youth and parents independently completed surveys. Bilingual research assistants were available to assist with completing surveys, but were universally declined. A New York City Metrocard (value 4.50 US Dollars) was offered to compensated pairs for their time in completing the survey.

Data analysis

Parent and youth responses to survey questions were compared using descriptive statistics, chi-squared and Fisher exact tests. Using Kaplan and Haenlein's definition of social media,²⁷ a variable was constructed, *social media for health communication*, defined as a positive survey response to at least one of the four survey questions about interest in using Twitter™, Facebook™/Myspace™, Instant Messaging (AIM™/iChat™) and Videoconferencing (Skype™/Oovoo™) for health communication. Unadjusted univariate analyses examined the association of regular use of six technologies (Internet, sending or receiving emails for health, Twitter, Instant Messaging, Videoconferencing, Facebook™/MySpace™) in daily life, with interest in social media for health communication (dependent variable). Variables significantly associated with the dependent variable ($P < 0.05$) in univariate analyses met criteria for inclusion in a multivariate logistic regression model. Three demographic variables, respondent (parent or youth), Spanish language preference for reading, and born in the United States were included in the multivariate model as control variables. Dyad perceptions of the other's text messaging use were analysed using Kappa statistics. All analyses were conducted using SAS 9.2 statistical software (Cary, NC, USA).

Results

Sample characteristics

In total, 142 youth and parents were approached in paediatric waiting rooms and 91.5% ($n=130$) agreed to participate in this anonymous survey. Of the 65 parent youth pairs, most (76.9%) were recruited at an adolescent clinic (Table 1). Survey completion took 12.3 ± 5.8 minutes for parents and for youth. The majority of adolescents (55.4%) were 10-13 years of age, born in the US (87.7%) and male (53.8%). Parents were predominantly female (92.3%), had a high school education or less (63.9%), and had immigrated to the U.S. (71.9%). Most parents and youth identified their ethnicity as Latino (80.0% and 76.9%, respectively) and race as either multi-racial or other race (63.1% and 64.6%). All subjects participated as dyads, allowing for direct comparisons of parent-adolescent pairs. More parents completed the survey in Spanish compared to adolescents (52.3% versus 3.1%, $P < 0.001$) and stated a

preference for reading health information in Spanish (58.5% versus 7.7%, $P < 0.001$).

Cell phone and text messaging

Parents more frequently owned a cell phone compared to youth (92.3% versus 67.7%; $P < 0.001$) (Table 1). Older adolescents (14 to 17 years) more commonly owned a personal cell phone compared to younger survey participants (82.8% versus 55.6%, $P = 0.02$). Nearly all parent and adolescent cell phones (88.3% and 95.5%) had text messaging capacity, with the majority of cell phone plans (72.6% and 76.2%) having unlimited texting. There were no significant differences in text messaging behaviours between youth and parent respondents by frequency of receiving, sending and replying to text messages.

Concordance was poor among parent-youth pairs regarding perception of the other's self-reported daily use of text messaging (Table 2). Parent perceptions of frequency of their youth's receiving and replying to text messages were accurate only 61.5% and 55.8% of the time, respectively ($K = 0.43$ and 0.36 respectively). Youth perceptions of their parent's frequency of use of these text messaging functions were also less consistent with parent stated frequency, being accurate only 40% (receiving text messages) and 30% (replying to text messages) of the time ($K = 0.19$ and 0.09 respectively). Approximately 40% of youth underestimated their parent's use of texting activities.

Other technologies

The majority of parents (74.6%) and youth (78.1%) reported having daily Internet access either via a cell phone or at home (Figure 1A). However, compared to parents, youth were more frequent users of the Internet (76.9% versus 45.3%, $P < 0.001$). Less than half of respondents used email often, with parents reporting more frequent use compared to youth (37.5% versus 15.4%; $P = 0.006$). Of the social media technologies, Facebook™/ MySpace™ was most frequently used by both youth and parents (55.4% and 60.0%, $P = 0.59$). Use of other types of social media, specifically Twitter™, Videoconferencing, and Instant Messaging, was far less frequent, with youth reporting greater use compared to parents (Videoconferencing 38.5% versus 13.9%, $P = 0.001$).

Using technologies for health communication

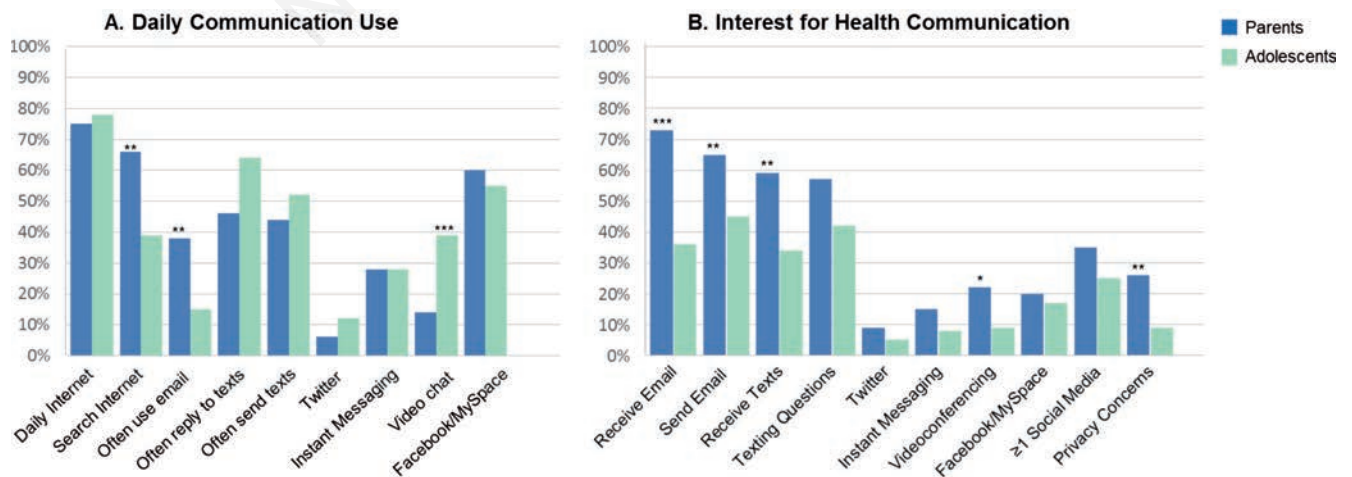
Compared to youth, parents reported greater experience in using technology to seek health information. The majority reported doing so through searching the Internet (65.6% versus 39.1%, $p = 0.003$) (Figure 1A), whereas only a minority had ever acquired health information through sending (18.8% versus 6.3%, $P = 0.03$) or receiving (28.1% versus 10.9%, $P = 0.01$) email. Similarly, compared to youth, parents reported greater interest in using technologies for health communication (Figure 1B), such as receiving text messages (58.5% versus 33.9%, $P = 0.005$). Despite their limited use of email on a regular basis, parents had greater interest in sending (64.6% versus 44.6%, $P = 0.01$) and receiving emails (73.4% versus 35.9%, $P < 0.001$) about health. Little interest in using social media for health communication was expressed by parents and youth. Notably, parents more frequently expressed privacy concerns compared to youth (26.2% versus 9.2%, $P = 0.01$) about using these technologies for health related purposes.

Table 3 presents unadjusted and adjusted odds ratios for the association between each of the technologies reported as used in daily life with the outcome of interest, interest in using social media for health communication. In the unadjusted analyses, each type of technology used in daily life with the exception of sending email about health and use of Twitter was associated with interest in social media for health communication. Controlling for these and demographic characteristics, users of Instant Messaging (aOR 3.3, 95% CI 1.3-8.5) and Facebook™/MySpace™ (aOR 4.6, 95% CI 1.4-14.7) in daily life and those born in the US (aOR 5.7, 95% CI 1.2-28.5) were more likely to be interested in social media use for health communication.

Table 1. Sample characteristics.

	Parent (N=65)		Youth (N=65)		P value
	N	%	N	%	
Language for completing survey					
English	31	47.7	63	96.9	<0.001
Spanish	34	52.3	2	3.1	
Recruitment site					
Pediatric/adolescent	-	-	50	76.9	
Subspecialty clinic	-	-	15	23.1	
Gender					
Female	60	92.3	30	46.2	<0.001
Youth age					
10-13 years	-	-	36	55.4	
14-17 years	-	-	29	44.6	
Parent age					
20-39 years	26	40.0	-	-	
≥40 years	39	60.0	-	-	
Race					
White	11	17.2	15	23.1	0.33
Black	7	10.9	5	7.7	
Asian/American Native	5	7.7	3	4.6	
Multiracial or Other Race	41	63.1	42	64.6	
Latino	52	80.0	50	76.9	0.39
US born	18	28.1	57	87.7	<0.001
Parent education					
≤High school	39	63.9	-	-	
≥Associate degree	22	36.1	-	-	
Youth education					
Grade 2-8	-	-	35	54.7	
Grade 9-12	-	-	29	45.3	
Preferred language for reading about health					
English/no preference	27	41.5	60	92.3	<0.001
Spanish	38	58.5	5	7.7	
Cell phone capacity					
Own cell phone	60	92.3	44	67.7	<0.001
Phone has text messaging*	53	88.3	42	95.5	0.29
Unlimited text messaging plan**	37	72.6	32	76.2	0.93
Text messaging					
Often send text messages**	31	50.0	46	63.9	0.09
Often receive text messages**	33	54.1	50	70.4	0.05
Often reply to text messages**	32	51.6	48	67.6	0.06

*Of those with personal cell phones; **Of those with phones having text messaging.



Responses are from 65 parent youth pairs; *P<0.05; **P<0.01; ***P<0.001; ≥1 social media is a positive response to using at least one of four social media types (Twitter, Instant Messaging, Videoconferencing, Facebook) for health communication.

Figure 1 Communication technology use in daily life and interest in using technology for health.

Discussion

The potential for novel mobile technologies and social media to support health and health services depends upon the acceptability and availability of the modalities used, interest in use for health information, and comfort with privacy protection. In our sample of Latino parent-youth pairs, text messaging was overwhelmingly the preferred method of communication for everyday and health-related purposes. A minority of parents and only a small proportion of youth used email, while use of the growing menu of social media applications was less frequent with the exception of Facebook™/MySpace™ which was used by more than half of parents and youth. Compared to youth, parents were more interested in email and text messaging for health communication; however, there was little interest by parents or youth regarding extending social media use to health communication. Of note, subjects were more likely to be open to receiving health communication through social media if they were routine Facebook or email users. Exposure to social media in daily life may make one more comfortable in the application of these media to health, a finding consistent with a previously reported survey of youth and adults with asthma.²³ Understanding these preferences within target populations is prerequisite to successful implementation of these technologies to support health and health services.

Consistent with a previous report,²⁸ the majority of our respondents owned cell phones equipped with texting capability. Youth in our sample preferred text messaging for daily communication, while parents preferentially used technologies such as email and the Internet for

health information. Although the majority of youth in our sample reported access to and frequent Internet use, fewer than half reported using the Internet to seek health information. The youth in our sample may rely exclusively on their parents for health information, prefer to separate their use of social media from health communication, or simply may not be as interested in seeking information about health.²⁹ Parents indicated far greater interest in use of email and text messages for health-related communication. These contrasts between parents and adolescents suggest substantive differences in their use and interest in electronic communication. These preferences may be specific to the options for electronic transmission of information and/or may reflect more general disinclination for medical communication from youth, parents, or both.

Perhaps not surprising, neither parents nor youth in our sample accurately estimated the text message frequency of the other with youth more frequently underestimating their parent's use of this technology. Health programs that utilize a specific communication modality may be more acceptable to paired participants when aligned to their perceived and actual use of these modalities. Lack of concordance has been noted in previous research regarding parent perception of child psychosocial functioning,³⁰ as well as child behaviours such as regular participation in their school's breakfast program³¹ and being recognized for academic success.³² In another study, youth with chronic illness who incorrectly estimated their parent's self-reported involvement in disease self-management had both poorer disease control and greater family conflict.³³ Collectively these findings suggest that discordance may be common and reaffirms the importance of seeking both

Table 2. Dyad perceptions of text messaging use.

Variable	Parent perception of youth use (N=44)			Youth perception of parent use (N=60)		
	N	%	\hat{K}	N	%	\hat{K}
Receiving text messages						
Overestimated use	10	19.2	0.43	7	11.7	0.19
Underestimated use	7	13.5		24	40.0	
Accurately estimated	32	61.5		24	40.0	
Didn't know	3	5.8		5	8.3	
Replying to text messages						
Overestimated use	7	13.5	0.36	9	15.0	0.09
Underestimated use	11	21.1		23	38.3	
Accurately estimated	28	53.8		19	31.7	
Didn't know	5	9.6		9	15.0	

Of 65 parent youth pairs, 60 parents and 44 youth had a personal cell phone; Analyses are based on 60 parent youth comparisons of youth perceptions compared with their parent's reported text messaging frequency and 44 comparisons of parent perceptions compared with their youth's cell reported text messaging frequency.

Table 3. Unadjusted and adjusted odds ratios (OR and aOR) for interest in using social media for health.

Variable	OR	95% CI	aOR	95% CI
Use Internet for health	3.4	1.5-7.9	1.8	0.6-5.4
Send health email	2.9	1.0-8.3	0.5	0.1-3.1
Receive health email	3.6	1.4-8.8	2.8	0.7-12.0
Use Twitter in daily life	2.2	0.7-7.0	0.6	0.1-2.6
Use Instant Messaging in daily life	4.6	2.0-10.4	3.3	1.3-8.5
Use Videoconferencing in daily life	3.4	1.5-7.7	2.7	0.8-8.8
Use Facebook™/MySpace™ in daily life	5.1	2.0-12.7	4.6	1.4-14.7
US born	1.1	0.5-2.3	5.7	1.2-28.5
Preference to read in Spanish	1.3	0.6-2.8	4.9	1.0-24.3
Parent <i>versus</i> youth	1.7	0.8-3.6	2.5	0.6-10.0
Older (14-17 yrs) <i>versus</i> younger youth	1.9	0.6-5.8	-	
Older (≥ 40 years) <i>versus</i> younger parent	1.0	0.3-2.8	-	

parent and youth perspectives when planning health programs that require their collaborative effort.

As communication methods expand, privacy concerns may arise for provider-patient interchange electronic communication modalities. Adolescents both in our sample and others expressed little concern for risks of violation of privacy.³⁴ In contrast, parents in our sample and those who participated in a recent national survey commonly expressed concerns about privacy issues for themselves, as well as for potential exposure of their children via electronic and social media.³⁵ Clearly, concerns regarding privacy protection must be addressed when harnessing new types of health communication to gain parent support for their youth's participation.

Limitations of our study include its cross sectional study design and that self-reported survey responses cannot be corroborated. Our sample was recruited from multiple clinics at one academic medical centre and may not be representative of those who receive care in other settings. The survey was limited to preferences for general aspects of health communication such as appointments and laboratory results. Parent-youth paired preferences may have differed for communication about more sensitive topics, such as sexual activity or reproduction.

These findings support the potential utility of mobile and novel social media to improve health in underserved youth. A recent survey indicates that social media is rapidly increasing among Latinos.²⁸ Use of social media for health communication will continue to expand for public health outreach, patient-specific activities and emergency response efforts,³⁶ and may help to reduce health disparities in underserved populations. To our knowledge, this is the first study to compare the perspective of underserved parents and their youth regarding their use of a wide variety of mobile technologies and preferences for the purpose of health communication. Our findings differ from those from adults surveyed in other underserved communities, highlighting the heterogeneity between communities. Uptake of these technologies may be more heterogeneous in underserved communities due to effects of resource limitations, language, education and culture.³⁷⁻⁴⁰ Variations in use of communication technologies and social media and preferences between parent-youth pairs suggest that understanding these factors within target populations is crucial for their successful use to support health and health services.

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