LOW-INCOME URBAN LATINO PARENTS' PERCEPTIONS OF IMMUNIZATION TEXT REMINDERS

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Objective: Identify perceptions regarding benefits of and barriers to receiving text messages for immunization reminders and preferred content for such text messages.

Design: Structured interviews.

Setting: Outpatient pediatric resident and faculty clinic.

Participants: A convenience sample of 54 low-income urban Latino parents of children aged ≤2 years.

Main Outcome Measures: Parent perspectives on text message reminders.

Results: Most respondents were female (70%), married (63%), and fluent only in Spanish (89%). Most (83%) had a health literacy score in the adequate range. All (100%) reported being interested in receiving immunization reminders by text message, and 81% reported being willing to receive general appointment reminders by text message. Parents made 72 comments regarding benefits of text message immunization reminders. The most common sub-category was usefulness of the reminders (53%). These comments reflected participants' busy schedules and the beneficial nature of text messages in reminding parents of appointments. Fifty-six comments were provided regarding barriers to receiving text message reminders. Most comments (77%) indicated no identifiable barriers. Twenty percent described barriers related to technology, such as costs or lack of text messaging service. Parents generated 108 comments regarding preferred content of reminders. The topics most frequently identified were appointment date and time (32%), names of the vaccines (19%), and the child's name (11%).

Conclusions: Low-income Latino parents perceive text message immunization reminders as a feasible alternative to more traditional forms of communication. (*Ethn Dis.* 2014;24[2]:229–235)

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Key Words: Immunization, Text Message, Latino

INTRODUCTION

Within the United States, Latinos are medically underserved; many experience multiple barriers to health care access and treatment, which result in health disparities.[1] Barriers may include lack of health insurance, low education levels, language barriers, distrust of the health care system, and cultural beliefs.[1–5] Language, in particular, has been identified as a barrier to health care in the United States,[6] and has resulted in increased emergency department cost and length of stay for Latino children.[7]

In 2011, 23.6% of US children were Latino, and by 2050, an estimated 39% will be Latino.[8] Despite the large number covered by Medicaid, Latino children continue to be the most uninsured racial/ethnic group.[9,10] Moreover, Latino children have lower immunization rates and encounter more barriers to immunization than non-Latino children despite government efforts (eg, Vaccines for Children).[11–14]

Reducing vaccine-preventable diseases through childhood immunizations is a well-recognized public health intervention.[15] With Latino infants being especially vulnerable,[16] programs specifically targeting this medically-vulnerable group are needed. While many factors, including poverty, contribute to parents not adhering to immunization schedules,[17–24] studies suggest compliance rates can be improved through reminders.[25]

The most frequently employed reminder methods for immunizations include mailed postcards or letters and phone calls.[26–28] Mailed notices can be easily lost and, among low-income patients, frequent address changes may mean reminders are never received. Phone calls/voicemail messages also have potential problems as parents report difficulty retrieving messages and accidentally deleting reminders.[28]

Cellular (cell) phone technologies, and specifically text messages have several advantages. First, 91% of Americans own a cellphone[29] and use is widespread, even among hard-to-reach and low-income families.[30] Second, 81% of cell phone owners use text messaging.[29] The widespread use of cell phones throughout the socioeconomic spectrum has created new avenues for disseminating health messages.[31,32] New communication technologies can increase participation in intervention studies,[33,34] and English-speaking parents prefer the idea of text message reminders to more traditional forms.[28,35] The potential for health-related text messages may be even greater among hard-to-reach, low-income and highly transient populations.

Most Latinos (86%) have a cell phone,[31] and of those, 72% text message.[32] In fact, Latinos are significantly

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more likely to text message than non-Hispanic Whites.[29] They also seem more willing to use and respond to promotional text messages, as nearly 20% more Latinos reported responding to direct marketing than average US adults.[36] Further, social marketing practices suggested mixed approaches, combining mediated health communication with interpersonal contact, were more effective in challenging beliefs, changing attitudes and promoting behavioral change, especially for campaigns geared toward well-defined communities.[37]

Text messages can increase compliance with adult and adolescent immunizations.[38,39] However, little is known about Latino parents' perceptions of text message immunization reminders. Even less is known about preferences of hard-to-reach populations, such as low-income urban Latinos, whose poverty may put them at higher risk for missed immunizations.[24] This information would be useful in creating culturally-appropriate immunization reminder strategies. Such targeted and tailored text messaging strategies have been found to be more efficacious than studies not using these strategies[40] (eg, Fjeldsoe's physical activity[41] and Rodgers' smoking [42] studies).

The purpose of our study was to explore immunization communication preferences of low-income urban Latino parents of young children (aged ≤2 years). Specifically, our study sought to identify perceptions of benefits of and barriers to receiving text message immunization reminders, in addition to content preferences for such reminders.

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METHODS

Participants

Participants were recruited at a pediatric resident and faculty clinic. Recruitment posters were placed in waiting and exam rooms and health care providers referred patients to the study. Eligibility included: 1) parent/caregiver of a child aged ≤2 years; 2) age ≥18 years; 3) Latino; 4) Spanish as primary language; 5) experience text messaging; and 6) able to provide informed consent. All participants in this convenience sample completed the study in Spanish and received a $35 gift card to cover time and travel costs.

Instruments

Three instruments were employed for this study. First, assessment of sociodemographic variables relied on a 10-item instrument[43] based on the Behavioral Risk Factor Surveillance System questionnaire.

Second, the 36-item short form of the Test of Functional Health Literacy in Adults (S-TOFHLA) was used.[44] The S-TOFHLA takes ≤7 minutes to administer and consists of two sections: 1) instructions for preparation for an upper gastrointestinal (GI) series, and 2) a Medicaid application.[45] The Gunning Fog readability levels were 4.3 and 10.4, respectively. These levels were computed using weighted averages of number of words per sentence and number of hard words, which were then converted to grade level equivalents.[46] The passages used a modified Cloze procedure, where every fifth to seventh word was removed. Health literacy scores of 23–36 were considered adequate, 17–22 marginal, and 0–16 inadequate.

Third, an interview guide was developed by a panel with expertise in pediatric infectious disease, health communication, health disparities, community psychology, and human factors psychology. The guide included current modes of communication with providers, satisfaction with these modes, perceived benefits of and barriers to receiving text message immunization reminders, and preferred content for these reminders. All questions were open-ended except for satisfaction, which used a four-point Likert-type scale.

All instruments were translated into Spanish (except the S-TOFHLA which had a validated Spanish version) by a local translation company. Translations were reviewed by two Spanish-speaking pediatric faculty members and one institutional review board (IRB) member fluent in Spanish. An employee from the same translation company conducted the interviews; she completed all research ethics trainings and conflict of interest requirements.

Procedures

This study was approved by the University of Kansas School of Medicine-Wichita Human Subjects Committee and the Wichita Medical Research and Education Foundation IRB. After the interview, a follow-up study was performed to identify optimal text message content and comprehension of sample text messages (described elsewhere).[43]

Statistical Analysis

Using IBM SPSS Statistics 20, frequencies and percentages were reported for categorical data, and means and standard deviations for continuous data. In addition, content analysis was performed on the open-ended item responses.

The two questions regarding benefits of and barriers to text message-based reminders used emergent coding where the content itself determined the categories.[45] Two investigators independently reviewed the content and compiled a list of emerging themes. Next, they compared lists and reconciled any differences. The investigators confirmed the reliability of the results: Cohen's Kappa=.83 for four benefits categories and Kappa=.95 for the three barriers categories.

Table 1. Respondent demographics

Characteristics	*n*	%
Sex		
Female	38	70
Male	16	30
Age		
<20	5	9
20–29	34	63
30–39	11	20
≥40	3	6
Missing	1	2
Marital Status		
Married	34	63
Unmarried couple	13	24
Divorced/separated	6	11
Never married	1	2
Children		
1	15	28
2	13	24
3	13	24
4	9	17
5	3	6
Missing	1	2
Education		
≤Grade 8	9	17
Grade 9–11	21	39
Grade 12/GED	22	41
≥College	2	4
Employment		
Employed for wages	26	48
Homemaker	21	39
Student	3	6
Out of/unable to work	4	7
Income		
<$10,000	25	46
$10,000–$14,999	1	2
$15,000–$24,999	4	7
$25,000–$34,999	21	39
$35,000–$50,000	3	6

Sixteen a priori categories were used for the preferred content question[28,35] plus one other category. Comments were assigned to the 17 categories by two independent researchers (Kappa =.82), and discrepancies were corrected by consensus. Frequencies of categories were computed.

RESULTS

Participant Characteristics

A sample of 54 urban Latino parents aged 18 to 50 years (mean=27, SD=7) participated. The majority were female (38; 70%), married (34; 63%), with one to five children.[35] Few (6; 11%) identified themselves as bilingual. More than half (30, 56%) did not complete high school and nearly half (26; 48%) described their jobs as employed for wages, with an annual income (from all sources) less than $15,000 (26; 48%) (Table 1). The majority (45; 83%) scored in the adequate range on the S-TOFHLA.

Table 2. Parents' satisfaction with current communication from child's health care provider

Satisfaction Level	Face-to-face *n* (%)	Telephone *n* (%)
Very satisfied	29 (54)	6 (30)
Satisfied	21 (39)	10 (50)
Dissatisfied	3 (6)	3 (15)
Very dissatisfied	1 (2)	1 (5)
Total	54 (100)	20 (100)

Current Communication Practices

Regarding current communication with their child's physician, all (54; 100%) parents reported engaging in face-to-face contact at the appointments, 37% (20) communicated via telephone, and one (2%) used e-mail. Satisfaction with face-to-face and telephone communication are described in Table 2. The parent who e-mailed with a physician reported being very satisfied.

Parents reported obtaining information about their child's immunizations at doctor's appointments (46; 85%), in mailings from the physician's office (9; 17%), and/or in mailings from health-related organizations (ie, health department; women, infants and children program; Medicaid) (5; 9%). Other sources included: family members (7; 13%), television (4; 7%), and the Internet (2; 4%). When asked how they knew when it was time to schedule their child's immunizations, the majority reported being told at their child's previous appointment and having to remember (40; 74%). One father (1; 2%) stated he was ''not sure, I just do it when his [the child's] mother tells me.''

All (54; 100%) of participants owned a cell phone with text messaging capability and were interested in receiving immunization reminders by text message.

Openness to Text Message Reminders

All (54; 100%) of participants owned a cell phone with text messaging capability and were interested in receiving immunization reminders by text message. Further, 81% (44) reported interest in receiving general appointment reminders, 78% (42) in receiving lab results by text, and two (4%) suggested follow-up texts after acute care.

Perceived Benefits and Barriers to Text Message Reminders

Parents made 72 comments related to the benefits of receiving text message reminders, which were organized into four categories (Table 3). The most prominent category was usefulness of reminders. Most of these comments were not text message-specific. However, the categories of convenience and speed, which accounted for nearly 35%

Table 3. Content analysis of participant comments about benefits

Emergent Themes	Definition	Examples from Participant Comments (Translated)	*n* (%)
Usefulness of reminders	Statements regarding being busy, forgetting appointments or losing dates	''Helps to remember the date.'' ''It's wonderful because I always forget my appointments.'' ''It's a better way to remind me…less likely to misplace reminder.''	38 (53)
Convenience	Information related to text messages being more available, utilized and attended to; Includes preferences for or avoidance of specific avenues of communication	''I always have my phone with me and check it constantly.'' ''Easy because I pay more attention to the cell phone all the time.'' ''I always check my text messages.'' ''Sometimes you can't understand phone messages.'' ''…wouldn't have to answer a phone call.''	17 (24)
Speed	The speed or immediacy with which information is available	''It is a faster way to get information.'' ''Perfect, easy reminder - faster than the other types.''	8 (11)
Other	Items not appropriate for the above categories	''Often the paperwork received in the clinic is lost or misplaced.'' ''Good idea'' ''They should have been doing this all along so the children don't fall behind on shots.''	9 (13)

of comments, described ways in which text message technology was beneficial or even preferred.

Parents made 56 comments regarding barriers to receiving text message immunization reminders (Table 4). However, most parents (43; 80%) could not identify any barriers. Of the remaining comments, all but two were related to text messaging technology, including loss of phone or service, lack of knowledge of technology, and cost per text.

Parent Preferred Content of Text Message Reminders

Finally, parents made 108 comments regarding content they would like to see in a text message immunization reminder (Table 5). The most commonly identified a priori category was date immunizations are due. The second most frequent category was other, which included comments regarding wanting more information on why vaccines are given, and non-immunization information.

DISCUSSION

To begin, we assessed current communication with providers regarding immunizations. Consistent with previous studies, the majority of communication between patients and providers was face-to-face or via telephone.[28,47] Overall, parents were satisfied with these modes of communication.[28] However, 63% of parents did not report any form of communication with providers outside of designated appointments. Moreover, 74% reported having to remember their child's next immunization visit. Also consistent with the literature,[48] and as reported in our previous publication,[35] parents were interested in receiving text message immunization reminders.

Participants reported benefits of text message immunization reminders including keeping appointments and schedules organized, convenience of using readily available cell phones, and speed with which information can be received. These comments were consistent with benefits identified by a group of urban predominately White, non-Hispanic parents.[28]

Most participants reported no barriers to receiving text message immunization reminders. Technological concerns, including not having service or a low-cost data plan, were identified by a small group of parents; it is important to note that many indicated these were not problems they faced, but others might. These findings are consistent with the literature in that cost and difficulty using cell phones serve as critical barriers to using this mode of communication for some.[48] However, Pew Research continues to report increases of adoption of this and other technology by Latinos.[31]

Although medical offices can often administer text reminders at a low cost,[49–51] practitioners must be cognizant of the cost for participants to receive such texts. Because it is unlikely all parents will have cellular phones with

Table 4. Content analysis of participant comments about barriers

Emergent Themes	Definition	Examples from Participant Comments (Translated)	*n* (%)
No barriers identified	Participant unable to identify drawbacks	''None'' ''It doesn't have any disadvantages''	43 (80)
Technology	Loss of service, costs, or lack of technological ability	''If my phone is off or I don't pay for service and I cannot receive the information'' ''My texts are pay per use, but still pretty cheap.''	11 (20)
Other	Items not appropriate for the above categories	''Unless the message came in English that would be hard for me to read.'' ''It could cause a problem if I receive messages at work.''	2 (4)

Table 5. Content analysis of preferred text message immunization reminder content

A Priori Category	Example (Translated)	*n* (%)
Date immunizations are due	''Appointment date and time'' ''The basics: appointment day and time''	34 (32%)
Other information	''Reminders of school physicals'' ''What I need to bring''	29 (27%)
Name of vaccine(s)	''Type of vaccine'' ''Names of the vaccines''	21 (19%)
Child's name	''Name of kid'' ''Child's name''	12 (11%)
Side effects	''Possible reactions of the vaccine'' ''Side effects of these''	5 (5%)
Number of shots	''How many shots'' ''Number of vaccines''	3 (3%)
Doctor's name	''Who is sending the message''	1 (1%)
General reminder	''First a reminder the shots are due''	1 (1%)
Name of vaccine-preventable disease	''Why they are needed; what they prevent.''	1 (1%)
What the disease can do to my child	''Consequence of not getting the vaccine''	1 (1%)
Clinic number; child's age; full immunization schedule; how the disease spreads; total number of specific vaccine needed; who is at risk; where your child is in the specific vaccine series		0 (0%)

text messaging capability and be willing to receive text messages, software that offers additional communication capabilities, such as automated voicemails may be ideal.

Finally, parents described their preferred content in a text message immunization reminder. The most frequently mentioned content items included date and time of upcoming appointments, names of the vaccines, and child's name. A recent meta-analysis found such targeting, tailoring and personalization increased the efficacy of text messaging interventions.[40] Scheduling information and child identifiers were also identified as important in a predominantly White, non-Hispanic group, however names of vaccines were not seen as important.[28] Depending on the number of vaccines required, the preferred information by Latinos could still easily be included in a text message of 160 characters. For example, one preferred message identified by Latino parents was as follows, ''Recordatorio: Su hijo necesita una vacuna Hib a los 18-meses para evitar enfermedad o muerte. Por favor llame al 555–5555 para hacer una cita,'' which translates into ''Reminder: Your child needs a Hib vaccine at 18-months to prevent sickness or death. Please call 555–5555 to make an appointment.''[35]

The implementation and cost advantages of text messaging suggest it may be a useful supplement to provider-patient communication; however, it does have disadvantages. This asynchronous communication may not allow for evaluation of comprehension, as often occurs in face-to-face interactions. For example, physicians often employ methods such as teach back which would be difficult to facilitate via text message.[52] Further, text messaging is impersonal, often automated, and may not support two-way texting, although such systems are available.[53] These limitations, combined with parents' high levels of satisfaction with face-to-face communication suggest text messaging may be most effective as a supplement to current communication strategies.

Other forms of technology may also be useful. E-mail, social media (such as Facebook and twitter) and other emerging technologies may offer providers multiple patient communication venues. Pew Research suggests social media use is significantly more common among young adults[54] and non-Whites.[55] In fact, 72% of Latino internet consumers report using social network sites, the highest of any race/ethnicity. Most of these programs have no paid plan associated with them, unlike text messaging, and having multiple contact methods could help overcome barriers, such as interruptions in cell phone service.[56] However, devices needed to access these programs (computers, smartphones) do have costs that should be considered.

Limitations

Generalizability of our study findings may be limited due to sample size. Latino parents came from a single Midwestern urban city, reported low-income, received predominately adequate health literacy scores, and were proficient with text messaging (data reported elsewhere).[35] Additionally, there is considerable variability within these populations (eg, Latinos, low-income), therefore further research is needed to determine to whom our study's findings are generalizable. Results will likely vary among those with less text messaging experience and low health literacy. Finally, in Kansas, Latinos tend to be native born and of Mexican origin.[57] Additional research is needed with foreign born Latinos, as this group is less engaged in technology use.[32]

Variables not addressed within the scope of this study, which would further enhance understanding of Latino parents' perceptions of text message immunization reminders, include preferred

frequency and length of content. Messaging strategies such as frequency, duration, modality and content can affect outcomes of communication.[58] In addition, moderated frequency and customized scheduling have enhanced efficacy of text message interventions.[40] Parental perceptions of immunizations also were not assessed and may have shed light on cultural barriers that could clarify some of the content preferences identified by Latino parents.

CONCLUSIONS

All participants reported they were willing to receive text message immunization reminders, and most reported no barriers to receiving these. Many participants identified ease, convenience, and speed as benefits of text message immunization reminders. The preferred content for immunization reminders is succinct and can be accomplished in a text message. Low-income Latino parents perceive text message immunization reminders as a feasible alternative to more traditional forms of communication.

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