



Pediatric Practices' Perceptions of Text Message Communication with Families: An American Academy of Pediatrics (AAP), Pediatric Research in Office Settings (PROS) Study

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Abstract

Background Text messages can be an effective and low-cost mechanism for patient reminders; however, they are yet to be consistently integrated into pediatric primary care.

Objective The aim of this study was to explore pediatric primary care clinician and staff perceptions of pediatric office text message communication with families.

Methods As part of the National Institutes of Health–funded Flu2Text randomized controlled trial of second-dose influenza vaccine text message reminders, we conducted 7 focus groups and 4 individual interviews in July–August 2019 with primary care pediatric clinicians and staff ($n = 39$). Overall, 10 Pediatric Research in Office Settings (PROS) pediatric practices in 10 states were selected using stratified sampling. Semi-structured discussion guides included perspectives on possible uses, perceived usefulness, and ease of use of text messages; practices' current text messaging infrastructure; and perceived barriers/facilitators to future use of texting. Two investigators independently coded and analyzed transcripts based on the technology acceptance model using NVIVO 12 Plus (intercoder reliability, $K = 0.86$).

Results Overall, participants were supportive of text reminders for the second-dose influenza vaccine, other vaccines, and appointments and perceived texting as a preferred method of communication for caregivers. Health information privacy and patient confidentiality were the main concerns cited. Only respondents from practices

Keywords

- ▶ text message reminders
- ▶ texting in pediatrics
- ▶ vaccine reminders
- ▶ Pediatric Research in Office Settings (PROS)
- ▶ primary care

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with no internal appointment text message reminder system prior to the study expressed concerns about technology implementation logistics, time, and cost.

Conclusion Text message reminders, for various uses, appear to be well accepted among a group of geographically widespread pediatric practices after participation in a trial of influenza vaccine text message reminders. Privacy, confidentiality, and resource barriers need to be addressed to facilitate successful implementation.

Introduction

Texting has become one of the most acceptable and frequent ways of communicating.¹⁻³

From transportation (e.g., Uber⁴ and Lyft⁵) and mailing (e.g., UPS package tracking⁶) to food and grocery delivery services (e.g., DoorDash⁷ and Instacart⁸), text message alerts and reminders and two-way customer communication have already been widely incorporated into consumer-oriented services. The health care sector is no exception. For instance, CVS Pharmacy offers text message reminders for prescriptions,⁹ Kaiser Permanente allows patients to opt in for text message appointment reminders,¹⁰ and behavioral health online services such as TalkSpace offer unlimited text messaging with a licensed therapist for both adults and teenagers.¹¹

Pediatric primary care faces a series of challenges that could be improved through enhanced patient communication. No-show visit rates vary by the type of clinical setting and population, but have been reported to be as high as 50% in primary care.^{12,13} Forgetting about an appointment is one common reason for no-shows across a variety of settings, including pediatric primary care.¹⁴⁻¹⁸ Missed appointments in pediatric settings reduce continuity of care¹⁹ and may put children's health at risk, potentially fueling increases in emergency department visits²⁰ or missed or delayed vaccination.²¹

Text messaging has been identified as a solution to a wide range of challenges in primary care practice. Patient reminders and recall messages have been recommended to increase appointment attendance and to improve immunization rates.^{22,23} A 2018 systematic literature review found that text message reminders in patient populations of various ages improved medical compliance (83/97, 85% of the reviewed studies, a subset of which included vaccination completion) and improved appointment scheduling outcomes (48/56, 86% of the reviewed studies).²⁴ With the majority of the U.S. population (97%) owning a cellphone across a wide range of demographic groups²⁵ and most cellphone owners using text messaging,²⁶ text messages can be an effective, low-cost, and scalable mechanism for reminding patients about appointments, vaccinations, and other health needs. Additionally, with the growing number of millennial and Gen-Z parents, text messaging is a preferred method of communication among these age groups.^{2,27}

However, text messaging systems are yet to be widely integrated into pediatric primary care as a standard of practice. Clinician and staff insights may reveal whether texting is considered as an acceptable way of communicating with families and shed light on perceived barriers and facilitators

of text message implementation in pediatric primary care. Our objective was to qualitatively explore pediatric primary care staff and clinicians' perceived acceptability, ease of use, and usefulness of text message reminders for various uses from pediatric primary care practices to families, and the external factors that might impact these perceptions.

Methods

In July–August 2019, after the end of data collection for the National Institutes of Health (NIH)–funded Flu2Text randomized controlled trial (RCT) assessing the impact of second-dose influenza vaccine text message reminders (clinicaltrials.gov: NCT03287830; grant [R01HD086045]), we conducted 7 focus groups and 4 individual interviews with pediatric clinicians ($n = 39$, including 16 pediatricians, 8 nurse practitioners, and 1 physician assistant), nurses ($n = 4$), medical assistants ($n = 5$), and practice staff ($n = 5$). Practices were part of the Flu2Text RCT, conducted in the American Academy of Pediatrics' (AAP) and Pediatric Research in Office Settings (PROS) primary care practice–based research network. Of the 37 primary care practices that took part in the second season (2018–2019) in the RCT, 10 practices from 10 states were selected for this study based on stratified sampling of the 5 practices with the highest and 5 practices with the lowest effect sizes for improvement in second-dose vaccine receipt with text message reminders. Half (5 of 10 practices) had an internal appointment text message reminder system that was established prior to the RCT and not related to the study intervention. Based on the scope of engagement with the research study, practice size, and participant availability, practices self-selected to participate in focus groups and/or individual interviews.

After obtaining verbal consent, all focus groups and interviews were conducted via telephone by two study staff moderators (E.N. and C.W.), clinical research coordinators, who are experienced in qualitative research. Focus groups and interviews lasted approximately 1 hour, and participants received a study-provided lunch to compensate for their time.

Moderators followed a semi-structured discussion guide. Topics about text messaging from practices to patients in primary care included practice perspectives about: (1) possible uses of text message reminders, (2) potential usefulness and ease of use of text messages, (3) current practice text messaging infrastructure, and (4) potential barriers and facilitators to practice use of text messaging (**► Supplementary Appendix A**, available in the online version). Examples of questions included: "How could vaccine-related text message

reminders be best integrated into the practice?" "For what other conditions or issues outside of vaccination might text messaging be helpful and why?" "What would you need to implement ongoing text message reminders to families?" and "What might be an acceptable cost (if any) of a future system that delivers texts?" The interview/focus group guide was developed by the study team and refined under guidance of an experienced qualitative methods researcher. The overall goal for this qualitative study was specified a priori in the study protocol: (1) "To collect in-depth feedback about practices' experience with the study; (2) to better understand parental and practice interest in future text message programs, and (3) to contextualize differences (if any) between text messages and usual care." The probing questions were not prespecified and emerged naturally as part of the semi-structured focus group/interview process based on the participant responses. Focus groups were audio-recorded and professionally transcribed. A conceptual content analysis (a technique commonly used in qualitative research to identify, relate, and quantify themes)²⁸ was conducted utilizing the technology acceptance model (TAM) as a conceptual framework. Key domains of the TAM framework included factors affecting technology perceptions (external variables), perceived usefulness of technology, perceived ease of use of technology, and attitudes toward using technology (→ **Supplementary Appendix B**, available in the online version).²⁹ Transcripts were independently coded by two investigators (E.N. and C.W.) using NVIVO 12 Plus. Using an iterative process, dominant themes emerged. Intercoder reliability was high ($K=0.86$) and all coding discrepancies were resolved by consensus. This study was approved by the American Academy of Pediatrics, Columbia University Irving Medical Center, and the Children's Hospital of Philadelphia Institutional Review Boards.

Results

Participating practices were geographically diverse and served a mix of publicly and commercially insured patients (→ **Table 1**).

Overall, participants were supportive of text reminders for the second dose of influenza vaccine, for other vaccines (e.g., human papillomavirus [HPV] vaccine), and appointments and expressed positive attitudes toward using text message reminders in their practices (→ **Table 2**):

"... that's been something that we've talked about as far as sending out text message reminders when they come due for any immunization, or if they're due for well check ... Your dentist will send you a text reminder, or your hair stylist ... every other service is going this way and it is ... how parents prefer to receive their communication. It's just so much easier. It's so much more tangible for them ... having a text where you can go back and reread it at another time is ... such a valuable tool ... it's almost limitless what you could use it for ..."

Perceived usefulness, which is a key component of the TAM, was a recurring theme in clinician and staff perceptions

Table 1 Practice characteristics

N = 10 practices	
Urbanicity	
Urban	2
Suburban	4
Rural	4
Region	
South	3
Midwest	1
West	4
Northeast	2
Practice type by patient insurance status ^a	
Mostly commercial	5
Mostly public	5
Appointment text message reminder system ^b	
Yes	5
No	5

^aPractice insurance type was assessed based on the insurance status of children enrolled in a larger Flu2Text clinical trial ($N=1,829$) and may not be representative of the insurance status of all patients at the practice.

^bInternal appointment text message reminder system that was established prior to the study and not related to the study intervention.

of text message reminders. From their experiences in the RCT, participants perceived second-dose influenza vaccine text message reminders to be helpful in prompting parents to return to the office in a timely manner:

"Because it was pretty clear to me, just by looking at those second dose dates, that this is a very effective intervention ... It worked so well for us, and our patients and our parents loved it. So, hopefully ... we can start doing this for other things ..."

Respondents shared that text reminders would be especially useful for vaccines with multiple doses, such as meningococcal B vaccine and HPV, because in the past they experienced difficulties with patients completing these series:

"And then for the series like the Men B, whenever they do get it, one month from that or two months or however the vaccine series is."

"Like the HPV, we can start at 10, but we normally start at 11 with their 11-year-old vaccines. And then to be able to put in a plug and have a text message go out in six months would be nice."

Additionally, they reported that reminders for adolescent vaccines could be useful as adolescents tend to miss appointments more often than younger children:

Table 2 Perspectives of pediatric practices on transition to text message use: key themes and exemplar quotes by technology acceptance model^a content area and theme

Technology acceptance model content area	Key themes	Pediatric practices
External variables (factors affecting technology perceptions)	Current appointment reminder system	“Well, the process we already use in our office is that when anybody has an appointment to come back, they get a text or a phone call saying they have an appointment. But it doesn't identify what the appointment is for.”
	EHR system integrated with appointment reminder system	“Our patient reminder in our old EMR, somebody had to set it up for every individual one. Our new EMR will do a mass message and it's very easy to do. So, it wouldn't necessarily require more manpower on the clinic staff.”
	Respondent perception of acceptability of text message reminders to child caregivers	“So, I would say the majority of them [caregivers] are tech savvy and they prefer it. They don't really want to talk to anybody. I mean I think we have a really diverse population. But even between our sort of tech savvy families versus our families that aren't, they all kind of prefer text message than [to] receive phone calls.”
Perceived usefulness of technology	Usefulness of text messaging for second-dose influenza vaccine reminders	“Because it was pretty clear to me, just by looking at those second dose dates, that this is a very effective intervention. So, I think it's great and we – it worked so well for us and our patients and our parents loved it. So, hopefully ... we can start doing this for other things. Because our parents are asking for it and it's just – I think the fact that there is a study that's being done is good news for everybody ...”
	Usefulness of text messaging for other vaccine reminders	Vaccine series: “I think we have several shots that are done in a series which we're often very good at initiating the series but sometimes it's hard to finish if the families – if we don't catch that or the families don't come back. If this kind of flu detect could be applied for other vaccines, like HPV and other series, I think it would really help increase our compliance of completing the series.”
		School-aged/teens: “Well, yeah, I think it could be generalized for all vaccines, especially teenage groups like kids getting the HPV or the Tdap, meningococcal. I think those reminders can be helpful for all vaccines.”
	Usefulness of text messaging for nonvaccine reminders	“And they [caregivers] ask why can't we do [text messages] with our regular appointments, why do we have to go to the phone reminder?”
Perceived ease of use of technology	Concerns about privacy	“I think it's [texting] a very valuable medium for disseminating information quickly. I think you have to be a little bit careful, needless to say, about health information privacy”
	Resources for text messaging system implementation	“If we were to implement this ourselves? So, the technology would definitely be a problem. That – we'd have to figure out if we could piggyback something specific on this with our appointment reminder system or – I'm sure we could figure out how to do it, it would just take some time, and effort, and money. All of those are in short supply.”
Attitude toward using technology	Views toward using text messaging in the future	“We have another work group right now that's trying to work on our overall vaccine rates and getting ... them up to date by the age of 2. And that's been something that we've talked about as far as sending out text message reminders when they come due for any immunization, or if they're due for well checks. I mean, I think that, honestly, we – and we talk about this at almost every meeting. Your dentist will send you a text reminder, or your hair stylist, you'll get a text reminder. It's like every other service is going this way and it is, like I said, how parents prefer to receive their communication. It's just so much easier. It's so much more tangible for them. And I know personally, too, a voicemail is not great because I oftentimes won't listen or it just gets lost in my mailbox and I – and so, I feel like having a text where you can go back and reread it at another time is just – it's such a valuable tool. So, I think that it's almost limitless what you could use it for. Again, with the right platform in place and the right kind of – you have to have the right technology to make sure that it's all secure and all of that.”

Abbreviations: EHR, electronic health record; EMR, electronic medical record; HPV, human papillomavirus.

^aDavis.²⁹

"Well, yeah, I think it could be generalized for all vaccines, especially teenage groups like kids getting the HPV or the Tdap, meningococcal. I think those reminders can be helpful for all vaccines. They usually tend to come in for their baby well checks, so it's not that big of a deficit I think in the younger kids. But teens don't come in for anything. They just forget and get involved in their own lives, and I think it would be beneficial to generalize to all vaccines, but especially to teen vaccines."

They also thought that text message reminders as opposed to phone calls or mail letters would be more useful and preferred by parents at their practices.

Under the perceived ease of use concept of the TAM, themes emerged regarding respondents' perceptions of concerns about privacy and practice resources for text message system implementation. Health information privacy and patient confidentiality were a recurring concern. Clinicians and staff especially wanted to ensure that information could be shared securely, without violating Health Insurance Portability and Accountability Act (HIPAA), and that information would be getting to the right person every time:

"I think ... it's been met with resistance in the past, with the idea that it would cost too much money or that it's not secure. But we know that there are very secure technologies out there that providers use to communicate, or they use to access records ..."

Some of the scenarios that came up in which participants voiced potential privacy concerns included parental disagreements about vaccination (e.g., HPV vaccine reminder being shared with the "noncustodial parent") and adolescent confidentiality (e.g., reminders about birth control appointments). The consensus across participants was to have generic appointment reminders that do not contain specific patient information (e.g., patient last name) or protected health information (PHI) (e.g., lab results). Practices also shared that while most families are comfortable with sharing their phone number, some are hesitant, especially if practice use of text message reminders could involve a third-party vendor external to the practice itself. Perceived generational differences came up as well, with respondents perceiving that younger parents might be more receptive to text messaging than legal guardian grandparents.

For the external variables component of the TAM (factors affecting perceptions about technology), we first examined participants' perceptions of parent/caregiver acceptability of text message reminders about their child's pediatric care. Participants perceived that parents/caregiver might prefer text message reminders from the practice:

"So, I would say the majority of them [caregivers] are tech savvy and they prefer it. They don't really want to talk to anybody ... I think we have a really diverse population. But even between our sort of tech savvy families versus our

families that aren't, they all kind of prefer [to receive] text messages than [to] receive phone calls."

As part of the external variables analysis, we also looked at the practices' existing appointment reminder systems and whether they were integrated with their electronic health record (EHR) systems. Half of the practices had an already existing general text message reminder infrastructure prior to the study:

"Well, the process we already use in our office is that when anybody has an appointment to come back, they get a text or a phone call saying they have an appointment. But it doesn't identify what the appointment is for."

Having an EHR that could facilitate text reminders was highlighted as helpful. This was especially true if the EHR system was integrated with the appointment reminder system and was set up for mass texting:

"Our patient reminder in our old EMR, somebody had to set it up for every individual one. Our new EMR will do a mass message and it's very easy to do. So, it wouldn't necessarily require more manpower on the clinic staff."

The content analysis revealed that these external factors (e.g., established EHR system integrated with appointment reminder system) were tightly connected with respondents' perceptions of the practice resources needed for text message system implementation, one of the themes under the perceived ease of use content area. Respondents from practices with no internal appointment text message reminder system prior to the study expressed concerns about technology implementation logistics, time, and financial commitment. Most preferred having the expertise of an external vendor to help with the texting platform setup, including text automation, EHR integration, and system security. Without knowing all the steps to implementation, the setup process was perceived by participants as time consuming and potentially costly:

"If we were to implement this ourselves? So, the technology would definitely be a problem ... we'd have to figure out if we could piggyback something specific on this with our appointment reminder system or – I'm sure we could figure out how to do it, it would just take some time, and effort, and money. All of those are in short supply."

When asked about acceptable cost of the text messaging platform, clinicians and staff could not provide an estimate and said it would be up to the operations and leadership team to make such an assessment. Respondents from practices with experience with their own internal text message systems did not express concerns about cost, logistics, or time commitment.

Interview and focus group themes did not differ between practices based on whether text messages for the second-dose influenza vaccine were effective in their practices in the larger RCT.

Discussion

In this qualitative post-intervention study, we have explored pediatric primary care clinician and staff perceptions of pediatric office text message communication with families in the context of TAM framework. Our results indicate that text message reminders, for various uses including the second-dose influenza vaccine, other vaccines, and appointments, were perceived to be useful among a geographically diverse group of pediatric clinicians and staff with varying levels of experience with text messaging. The importance of keeping patient health and personal information safe when using text messages was one of the repeatedly emphasized topics across all participants. Concerns about technology implementation logistics, time, and financial resources were voiced primarily by practices without an existing text messaging infrastructure prior to the study. Overall, attitudes toward using the technology were positive in this sample of participants, who reported that text message communication would be preferred by parents/caregivers over phone calls and mail. Each practice should still consider their unique patient/family sociodemographic makeup (e.g., age, language, access to cell phone/stable phone number) when choosing the best reminder strategy and recognize texting as one of the potentially effective strategies.

While other studies have examined the effectiveness of text message reminders for various purposes in mostly non-pediatric settings,^{24,30–36} limited literature is available on the acceptability of text message reminders among the U.S. pediatric clinicians and staff. A 2009–2010 survey of family physicians and pediatricians in a single metropolitan area in Kansas found that of 102 providers who completed the survey, none used text or email for child immunization reminders and one-third (31%) of the participants said that even with all of the necessary resources they would be “very unwilling” or “unwilling” to implement a text messaging program for childhood vaccines.³⁷ Conducted a decade later, although from a sample of practices that self-selected to participate in a larger RCT of second-dose influenza vaccine text message reminders, our study adds evidence of different perspectives in clinician and staff readiness and acceptability and perceived usefulness of text message reminders for various uses in pediatric primary care, including immunizations. Additionally, half the practices represented in our study had their own internal appointment text messaging reminder system, potentially giving our sample more experience with texting than participants from prior studies. Pediatric clinicians and staff from prior studies, which were conducted in the first decade of the 21st century, can be considered early adopters of mass text messaging technology. With the present widespread use of text message reminders, resistance to text messaging may be coming not from its novelty but from its perceived implementation barriers. Furthermore, as we observed in our sample, these perceived barriers did not emerge as a theme among the participants from practices that have already adopted a text messaging system. Still, outside of clinician-owned practices, the decision to implement a text messaging system in pediatric primary care practices may often be under the purview of administrative and operational leadership.

One of the primary themes across practices with no existing appointment text message reminder infrastructure was the need to address privacy, confidentiality, and resource barriers to facilitate successful implementation of a text message reminder system. A 2009–2010 qualitative study among clinical and administrative staff of 19 primary care sites located in south-central region of the United States echoed primary themes around concerns with patient privacy, legal opt-in options, costs, and parent contact preferences.³⁸ In contrast to our study, none of the participating practices had an e-mail or text message immunization or appointment reminder program at the time of the research, but, similar to our study, they expressed interest in such a system.³⁸ An additional barrier to texting, especially salient for independently run practices, is that the cost of any texting program falls on the owners of the practice. Therefore, approaches that readily integrate with existing EHR systems at reasonable cost are needed.^{39,40} Moreover, as practices increasingly use the EHR to text, having flexibility to customize reminders to practice needs will be especially important. As texting becomes more commonplace in health care and a growing number of vendors offer texting services, some of these concerns may be resolved. Lastly, text message reminder infrastructures should be set up in accordance with HIPAA rules and the Health Information Technology for Economic and Clinical Health (HITECH) Act to protect patient and family private information.⁴¹ For instance, practices that offer texting may provide families with a way to allow those interested to opt in/opt out. This study has several limitations. Our sample is a convenience sample from practices that already completed our Flu2Text trial of text message reminders for the second-dose influenza vaccine and included practices that may have been highly motivated to improve their rates of uptake of the second dose of influenza vaccine. Perspectives of practices outside the study may differ. Nonetheless, the experience of having patients receive text messages may have informed insights that could not have been gathered from practices unfamiliar to text messaging. In addition, text message reminders for the trial were set up externally (by the study team) and implemented through a third-party provider, so practices did not have experience implementing text messages on their own. Still, half of the practices in the current study (five practices) did have an appointment text message reminder system prior to the study, which indicates a priori acceptability of text message reminders to those sites. Participants' roles were blinded during transcription process and therefore we use a collective term “pediatric clinicians and practice staff” to refer to our sample. Perceptions of caregivers' interactions with and preferences for text messaging were gathered solely through the lens of clinicians and staff. However, much of the existing research on attitudes toward text message use in the clinical pediatric setting focuses on the caregiver's perspective; our study contextualizes the perspectives of the clinical providers and staff. Lastly, we do not have complete patient demographic data for participating practices and therefore were unable to compare differences between practice sites based on patient characteristics.

Our work adds to the current literature on acceptability of text message reminders among pediatric clinicians and staff and gives insights into perceived ease of use, usefulness, and external factors that affect attitudes toward text messaging. Our sample included respondents from a geographically diverse mix of practices with varying degrees of experience with text message reminder systems. Our results highlight the importance to practices of addressing privacy and logistical concerns as part of the implementation. Additionally, results suggest that practices without existing text message infrastructure have interest in help from outside vendors to facilitate EHR integration for automatic reminders. Our results highlight positive perceptions of text messaging in practices with experience with their patients receiving these messages.

Clinical Relevance Statement

Text message reminders have shown to be effective at increasing appointment attendance and improving immunization rates²²⁻²⁴; however, they are yet to be consistently adopted in pediatric settings. Our work updates the current literature on acceptability of text message reminders among pediatric clinicians and staff and gives insights into perceived ease of use, usefulness, and external factors that affect attitudes toward text messaging in pediatric settings.

Protection of Human and Animal Subjects Protections

The study was approved by the Institutional Review Boards of the Children's Hospital of Philadelphia (CHOP), Columbia University, and the AAP.

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Conflict of Interest

A.F. reported receiving an independent research grant from Pfizer for work unrelated to this project and unrelated to vaccination. No other disclosures were reported.

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