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Direct-to-adolescent text messaging for vaccine reminders: What will parents permit?

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ABSTRACT

Background: Direct-to-adolescent text messaging may be a consideration for vaccine reminders, including human papilloma virus (HPV), but no studies have explored the minimum age at which parents would allow adolescents to receive a text message.
Methods: We distributed a survey to parents of 10–17 year olds during any office visit in two practice based research networks in South Carolina and Oklahoma. We asked about parental preference for receiving vaccine reminders for their adolescent, whether they would allow the healthcare provider to directly message their adolescent, and if so, what would be the acceptable minimum age.
Results: In 546 surveys from 11 practices, parents of females were more supportive of direct-to-teen text message reminders than were parents of males, (75% v. 60%, $p < .001$). The median age at which parents would allow direct text messages from physicians' offices was 14 in females compared to 15 in males, $p = .049$. We found a correlation between the child's age and the youngest age at which parents would allow a direct text message. Of the parents who permitted a text message directly to their adolescent, most reported an allowable age higher than their adolescent's current age until the age of 15.
Conclusion: Our study suggests that direct-to-adolescent text messaging would be allowed by parents for older adolescents. This supports an intervention aimed at older adolescents, such as for receipt of MCV4 dose #2, delayed HPV vaccine series completion and annual influenza vaccination.

1. Introduction

Many adolescents do not get vaccinated on time, and as a result, remain under-immunized and at risk for vaccine preventable illness. All U.S. adolescents at 11 to 12 years of age should receive one dose of the quadrivalent meningococcal conjugate vaccine (MCV4), 1 dose of the tetanus-diphtheria-acellular pertussis (Tdap) vaccine, and, until December 2016, 3 doses of the human papillomavirus (HPV) vaccine [1–3]. At that time, the Advisory Committee on Immunization Practices of the Centers for Disease Control and Prevention (CDC) recommended a change to a 2-dose series for the HPV vaccine for immunocompetent adolescents who initiate the series between the ages of 9–14 years [4]. The HPV vaccine is not the only adolescent vaccine that has a subsequent dosing schedule. All adolescents are to receive a second dose of the MCV4 at 16 years of age [5]. All adolescents are to receive an influenza vaccine every year by the end of October [6].

The National Immunization Survey-Teen survey found that, among US adolescents 13–17 years of age in 2016, only 49.5% of females and 37.5% males had completed the 3-dose HPV series. When evaluating series completion by age, there is little change in the up-to-date (UTD) rates beyond 15 years. By age 17, 65.4% of all adolescents have started the series, but only 47.3% completed the series [7]. UTD rates for Tdap are 88% [7]. For the MCV4, while 83.5% of all adolescents receive the initial dose, only 39.1% received the second dose [7]. In 2016, only 28.7% of 13–17 year olds received a flu shot, compared to 45.0% of 6 month-4 year olds (Table 2 in https://www.cdc.gov/flu/fluvaxview/nifs-estimates-nov2016.htm#data – accessed on 2/9/18).

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Numerous barriers for adolescent vaccination have been identified. These include a lack of parental knowledge about the vaccine and a lack of awareness that their adolescent is due [8–15]. The lack of a provider recommendation was noted for the three primary adolescent vaccines (Tdap, MCV4, and HPV vaccine). In addition, between 13% and 17% of parents reported their opinion that vaccines were not necessary. Concerns about safety of the vaccine were reported specifically for HPV vaccine [15]. Another barrier specific to HPV vaccination rates is because the dose or doses were not received according to the recommended schedule [16,17].

A system of reminder and recall including text messaging may be useful in increasing rates for HPV vaccine completion, receipt of the second meningococcal vaccine, and annual influenza vaccination [18]. Adolescents increasingly use text messaging [19], which is also reported to be their preferred method to communicate for health concerns [20]. Parents also view this form of communication as beneficial for receiving vaccine reminders [21].

Text messaging has been studied for adolescent vaccine reminders and has demonstrated a modest improvement in rates for HPV UTD in girls [22–25]. However, these studies have focused on sending text message reminders to the parent but not to the adolescent. One study, which reported experience with texting adolescents about asthma care, examined 64 patients aged 12–22 years, with a mean age of 17; however the authors did not comment on whether they had difficulty recruiting adolescents or obtaining parental permission [26]. In 2006, Haller found in Australia that 97% of adolescents 16–24 years would consent to text messaging for clinical research [27].

Direct-to-adolescent messaging may be useful for vaccine reminders, but no studies have explored whether parents would allow their adolescents to receive text messages directly from medical providers. Nor have they studied the minimum age at which parents would permit direct text messaging. This study's objectives were to address these gaps in vaccination research by assessing parents' preferences about modalities for vaccine reminders (phone, text message, email, US mail), the acceptability of providers texting adolescents directly with vaccine reminders, and the minimum age at which parents would permit texting.

2. Methods

2.1. Survey development

We developed a survey instrument de novo to inquire about parents' opinions on preferred methods of provider communication with parents and their adolescent. The survey instrument, which is available from the authors on request, queried if both adolescents and parents had personal cell phones, and whether those phones could receive free text messages. We also asked about preferences for communication modalities (email, phone, text message, US mail), and whether they would prefer to receive reminders about the adolescent's upcoming immunizations. Parents were also asked whether they would permit direct messaging to their adolescent, and if so, the age at which the child could receive direct-to-adolescent messaging.

The survey was developed by the authors, and was pilot tested among a group of parents for clarity, and then revised based on their responses. The survey was translated into Spanish using a certified translator. We included a cover sheet with the survey containing a brief description of the study and assurances that the decision whether or not to participate was voluntary and would not affect the care the adolescent received at the practice. Although the introduction included medical terminology, raising the reading level for the rationale, the survey questions themselves were written at third grade level.

2.2. Setting

This study took place in pediatric practices that are active members in either the South Carolina Pediatric Practice Network (SCPPRN), located at the Medical University of South Carolina (MUSC), or the Oklahoma Child Research Health Network (OCHRN), which is affiliated with the University of Oklahoma (OU). Both Networks are socio-economically and racially/ethnically diverse. In SCPPRN, the range of Medicaid recipients among practices ranges from 5% to 90%, and the range of Black race ranges from 5% to 84%. Four SCPPRN practices have at least 30% Hispanic patients. Likewise, OCHRN is similarly diverse. Sites vary from 4% to 97% Medicaid, 5% to 76% Hispanic, and 1% to 25% Black.

2.3. Survey distribution & collection

We distributed a survey to adults responsible for 10–17 year olds during any office visit (sick or well) in seven practices in SCPPRN and four practices in OCHRN. We refer hereafter to the responsible adults as parents. The front office staff members or triage nurses asked parents to complete the survey. We asked each practice to obtain 50 surveys. Parents of any adolescents age 10 to 17 were eligible to complete the survey, and we did not exclude parents based on gender, race, or language proficiency. We did not collect identifying information, nor did we provide incentives to complete the survey.

Staff in the research network practices collected the paper surveys from the parent and placed in an envelope for research staff to pick up. For the surveys located in the OCHRN, research staff scanned the surveys and uploaded to a secure connection between OU and MUSC.

2.4. Data analysis

Research staff entered survey information into the Research Electronic Data Capture (REDCAP) database, a secure, online system for management of survey data [28]. Data were exported from REDCAP to SAS version 9.4 (Cary, NC) for analysis. We calculated frequency distributions and descriptive statistics. We used chi-square tests to compare messaging preferences of parents of male and female adolescents. We used the median two-sample test to compare, by adolescent's gender, the minimum age at which parents would permit direct text messaging. All the tests were 2-sided, with $\alpha = .05$ and $P < .05$ considered statistically significant.

This study was approved by the Institutional Review Board (IRB) at the Medical University of South Carolina and the University of Oklahoma.

3. Results

We collected 546 surveys from 11 practices among the two practice based research networks (PBRNs). Table 1 lists the demographic variables of the sample. Table 2 lists parental responses about preferred communication methods from physicians about vaccines and vaccine reminders. Nearly all parents (95%) and most adolescents (65%) have a text-message enabled cell phone. Out of the 86% of respondents who would find a reminder about vaccines helpful, 67% would allow a text message sent directly to their adolescent from a physician's office. Out of the entire sample, 75% of parents of girls and 60% of parents of boys would allow direct messaging. More parents preferred text message reminders (70%) than any other type of reminders for vaccines ($p < .0001$).

Table 3 shows the parental responses about vaccine reminders and demographic factors stratified by adolescents' gender. Of note, parents of females were more permissive in allowing direct-to-