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The Acceptability of Incorporating a Youth Smoking Prevention Intervention in the Pediatric Emergency Department

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Abstract

The pediatric emergency department (PED) is under-utilized as a setting in which to provide tobacco prevention interventions for at-risk children. We sought to determine the acceptability and feasibility of incorporating a brief, parental tobacco prevention intervention to 520 parents during the PED visit. Mean age (SD) of parents and children was 38.6 (7.1) and 11.5 (1.1), respectively; 47% of children were female; 45% were African American; 36% of parents had an annual income less than \$25,000; 28.8% of parents were current smokers. Over 90% of parents said the intervention provided “useful” and “easy to understand” information and 97% of practitioners said it did not “interfere with clinical care.” Given the high prevalence of parental smoking in the PED, there is a high likelihood that their children will initiate smoking in the future. Thus, the use of the PED as a venue to providing tobacco prevention interventions warrants further evaluation.

Keywords

Tobacco; adolescent smoking; emergency department; parenting; prevention and control

Smoking is the single most preventable cause of death and disease in our society.¹ Lifetime smoking and use of other forms of tobacco usually begin before high school, with almost 90% of adult smokers beginning at or before age 18.² Despite decreases in child smoking rates, the 2012 Monitoring the Future Survey reported lifetime smoking prevalence rates of 39.5%, and past month smoking rates of 17.1% in 12th graders.³ Parental influences are important in preventing child smoking initiation.^{4–8} Higher levels of anti-smoking parenting practices such as setting rules about smoking, discussing smoking related topics, and demonstrating negative attitudes towards smoking, have been shown to decrease child smoking initiation.^{7,9–11} A recent Cochrane Review demonstrates that home and school-based interventions designed to help parents prevent child smoking may be effective.¹² However, there is an unmet need for the use of child tobacco prevention interventions in

health care settings. Although the American Academy of Pediatrics (AAP) recommends that child tobacco prevention counseling should be given during medical visits,¹³ few parents are receiving such interventions.^{14–18}

In response to this need, we have developed a child tobacco prevention intervention for use in the pediatric emergency department (PED).¹⁹ We chose this setting because there is an alarmingly high prevalence of smoking of up to 47% in parents who bring their children to the PED.^{20–23} These high rates are a matter of concern not just because of the implications on the parent's health, but because parental smoking results in adverse health effects in children due to secondhand smoke exposure^{17,24–27} and is a risk factor for smoking susceptibility and initiation in children.^{28–32} Furthermore, up to 50% of these parental smokers and their children are from low-income households,^{22,33} have limited interactions with a pediatric primary care provider, and many utilize the PED for nonurgent complaints.^{34–36} Thus, they are unlikely to receive tobacco prevention interventions in the primary care setting. Furthermore, these parents are interested in receiving tobacco-related interventions in the PED while they are waiting for their child to be seen by a physician.^{19,37}

Previously, we developed a tobacco prevention intervention geared to parents of children who had not initiated smoking called IMPACT (Improving Parent/Adolescent Communication about Tobacco). That program was developed based on social learning theories of behavior change,³⁸ with specific emphasis on modeling and empowering parents to feel efficacious in helping their children to avoid tobacco use. Its content included training in how to use both verbal and body language to express anti-tobacco attitudes and rules, and how to improve child refusal skills to tobacco requests in a way that was culturally and linguistically appealing to our PED parent population. We chose to tailor the IMPACT intervention on race/ethnicity and smoking status based on the literature showing the enhanced efficacy of tailored interventions over generic tobacco related materials.³⁹ Four different 5–7 minute videos on DVD were developed to target parents in the predominant racial/ethnic groups (approximately 50% non-Hispanic White and 50% African American) and smoking status groups (over 40% of our parents are smokers) of our PED population.^{20,22} Thus, the DVDs were tailored on parental race and smoking status (e.g., African American vs. White and smoker vs. nonsmoker). Additionally, since the prevalence of tobacco use among children age 13 and younger is very low in the U.S. (under 2% in eighth graders), but increases steadily in high school,³ the intervention was geared to parents whose children were 10–13 years of age in order to intervene in the families of children who had not yet begun to smoke, but were at risk for initiation.

Parents watched one of the IMPACT intervention DVDs while the child was waiting to receive further medical care in the PED; children could also watch the videos if they chose, thus children were passive recipients of the intervention. The videos were designed: a) to increase parents' self-efficacy to influence their child's smoking behavior; b) to teach the social skills needed to talk effectively about tobacco use within their child's social context; c) to promote parental expectations that tobacco use behavior is not normative and is perceived negatively by the parent; and d) to prompt parent-child discussion of tobacco use behaviors. In addition, the videos showed child role models who demonstrated the importance of being able to resist tobacco offers despite peer pressure. Written instructions

consisted of a colorful 4×6 inch magnet card that included five key steps for discussing smoking. This intervention was qualitatively tested with parent/child dyads recruited from a PED. Further details of intervention content and development are described elsewhere.¹⁹ This paper describes the acceptability of incorporating this viewing of this IMPACT intervention DVD during the PED visit; specifically, we present the (1) baseline characteristics of our sample; (2) feasibility of recruiting, enrolling, and collecting baseline data, and incorporating the delivery of the intervention during the PED visit; and (3) the acceptability of IMPACT to parents and practitioners.

Method

Setting and participants

The study was conducted between April 2008–October 2010 in the PED of Cincinnati Children's Hospital Medical Center (CCHMC), which is an urban-based, tertiary care pediatric hospital with an annual PED visit rate of over 100,000. This study was approved by our hospital's institutional review board.

The IMPACT intervention was geared to parents of children who were never-smokers. Thus, eligibility was determined in two steps; first based on a short screening of the parents by the clinical research coordinator (CRC), and second based on a short screening self-administered questionnaire completed by the child. Adults were eligible if they were the parent accompanying a 10–13 year old child to the PED who was triaged in the non-urgent category (e.g., cough, rash, ear pain), were able to speak and read English (due to lack of resources for translation), had a working phone number, and had no plans to move within the next seven months. Children of potentially eligible parents were eligible if they were never-smokers. Thus, children were prescreened to exclude those who were regular smokers (defined as those who reported daily smoking for the past seven days) or experimenters (defined as those who reported that they had ever smoked at least one puff of a cigarette). If either the parent or child were deemed ineligible, then they were both excluded.

Recruitment and enrollment procedures

Trained clinical research coordinators (CRC) screened a convenience sample of parents of pediatric patients presenting for treatment using CCHMC's electronic medical record system, EPIC. Clinical research coordinators approached, screened, and explained the study to eligible dyads; informed consent was obtained on parents and assent on children. Dyads completed a baseline assessment during the PED visit on a tablet computer. Parental participants were assigned by computer algorithm to one of two conditions using simple randomization: Intervention group or Usual Care Control. Since the intervention was geared to parents, children were considered passive recipients of the intervention. At baseline, Intervention Condition dyads and Usual Care Control dyads received a \$20 and \$15 gift card, respectively.

Study conditions

Parents randomized to the Intervention Condition received the IMPACT intervention by the CRC which consisted of: 1) the IMPACT DVD and 2) written instructions. Parents and

children watched one five to seven minute IMPACT intervention DVD and received the instruction card while the child was waiting to receive further medical care in the PED.

Usual Care Control dyads received treatment as usual. They were not given any of the intervention components nor were they given any smoking-specific information.

Baseline and follow-up assessments

Overview of assessments—In order to assess the feasibility of enrolling parent/child dyads, we obtained frequency and demographic data on parents who were: eligible, approached, enrolled, declined enrollment, and reasons for such declining, if applicable. The baseline assessment for parents included questions on sociodemographic characteristics, tobacco use, parent-child anti-smoking communication, reaction towards child smoking, and self-efficacy related to tobacco behavior. The baseline assessment for children included questions on demographics, parent-child anti-smoking communication, reactions towards child smoking, child self-efficacy to resist smoking, and child intention to smoke (see Tables 1 and 2).

Parent measures—Parent sociodemographic characteristics of gender, age, race, education, income, and smoking status were assessed. Parents were considered regular smokers if they had smoked in the prior seven days.

Parent-child anti-smoking communication: Seven items^{11,40} were used to measure whether and how often parents made statements about smoking to their child (e.g., “Smoking cigarettes is bad for you”). Item responses ranged from 1 (no, never) to 5 (always). Scale scores were the mean of responses to all items, and higher scores indicated a greater frequency of messages (Cronbach’s alpha = .88).

Reactions toward child smoking: Seven items⁹ were used to measure what reactions parents had if they were to find out that their child had smoked just once (e.g., “I would punish him/her”). Responses ranged from 1 (strongly disagree) to 5 (strongly agree), with higher mean scale scores indicating strong positive reaction of parents to child smoking behavior (Cronbach’s alpha = .72).

Tobacco-related self-efficacy: Parental self-efficacy to influence their child’s smoking behavior (i.e., confidence in their ability to prevent their child from smoking, enforce house smoking rules) was assessed using seven items.¹¹ Responses ranged from 1 (not at all confident) to 10 (extremely confident), with higher mean scale scores representing greater efficacy (Cronbach’s alpha = 0.88).

Child measures—Child demographic characteristics of age and gender were assessed.

Parent/child anti-smoking communication: Seven items^{11,40} were used to measure whether and how often children reported that parents made statements to them about smoking (e.g., “Smoking cigarettes is bad for you”). Item responses ranged from 1 (no, never) to 5 (always). Scale scores were the mean of responses to all items, and higher scores indicated a greater frequency of messages (Cronbach’s alpha = .87).

Reactions toward child smoking: Seven items⁹ were used to measure what reactions children perceived that their parents would have if they found out that they had smoked just once (e.g., “He/she would punish me”). Responses ranged from 1 (strongly disagree) to 5 (strongly agree), with higher mean scale scores indicating strong positive reaction of parents to child smoking behavior (Cronbach’s alpha = .74).

Child self-efficacy to resist smoking: Eight items were used to assess self-efficacy to resist smoking offers (e.g., refuse to smoke if asked by best friend).⁴¹ Responses ranged from 1 (definitely disagree) to 5 (definitely agree), with higher mean scale scores representing greater efficacy (Cronbach’s alpha = .90).

Child intention to smoke: Five items were used to measure intention to smoke: “Do you intend to smoke: 1) ever, 2) with friends, 3) with parents, 4) within 6 months, and 5) within 2 years.” Responses ranged from 1 “definitely not” to 5 “definitely yes” (Cronbach’s alpha = 0.89). The scores were summed so that a high score implies a high intention to smoke.⁹

Intervention acceptability assessments—Intervention parents were asked seven questions measuring satisfaction with the intervention. Satisfaction questions had 5-point Likert responses ranging from “strongly disagree” to “strongly agree.”

In addition, medical doctors or nurse practitioners caring for each Intervention parent’s child were asked two questions to assess their acceptability of incorporating the IMPACT intervention in the ED. The questions were: “This study interfered with patient care” which had a 5-point Likert responses ranging from “strongly disagree” to “strongly agree” and “The length of the study was: just right, too short, or too long.”

Data analysis

Mean values, standard deviations, and frequencies were estimated for continuous and categorical variables. Subgroup analyses by gender, age of child, race (African American vs. White and other races), income, and parental smoking status were performed. Statistical analyses were performed using SAS 9.2 (SAS Institute, Inc., Cary, North Carolina).

Results

Study recruitment

Of the approximately 669 parents approached, 536 parents consented to participate (82%). Data were excluded from baseline analysis if a questionnaire was missing more than 50% of data items (n = 10) or if children were regular smokers or experimenters (n = 6); thus, 520 (97%) were included in the baseline analysis. A total of 257 (49.4%) parents were randomized to the intervention condition. There were no statistically significant differences in sociodemographics or parental smoking status between the intervention and control conditions. The most common reasons for decline of study participation (N = 133) were not interested (41%) and not enough time (17%).

Participant characteristics at baseline

Mean age (SD) of the parents and children was 38.6 (7.1) and 11.5 (1.1), respectively; 47% of the children were female; 45% were African American and 47% were White. The majority of parents (97%) had completed high school, 36% had an annual income of less than \$25,000; and 150 (28.8%) were current smokers. The sociodemographic characteristics of our participants was similar to those of other studies that our group has conducted in this setting and similar to the population in this PED. The majority of children reported that they would “definitely not” smoke: ever (87%), with friends (90%), with parents (96%), within six months (95%), or within two years (94%). Mean (SD) parental ratings on frequency of parent-child smoking communication (range 1–5) and parental reaction to smoking behavior (range 1–5) were high at 3.81 (0.9) and 4.33 (0.6), respectively. Parents had high perceived self-rating of anti-smoking self-efficacy (range 1–10) with mean (SD) 8.77 (1.1) and children had a moderate mean (SD) rating of self-efficacy to resist smoking offers (range 1–5) of 4.43 (0.7).

In subgroup analysis of parents by gender, fathers were more likely to report stronger reactions to child smoking behavior compared to mothers (4.39 vs. 4.28; $p = 0.05$); however there were no differences based on child gender. Children 12 years of age and older were more likely to report intention to smoke (1.14 vs. 1.07; $p < .01$) and parents of children younger than 12 were more likely to report stronger reactions to child smoking than parents of older children (4.39 vs. 4.27; $p = .02$).

In subgroup analysis by race, there were statistically significant differences in African American parents compared with Whites and other races in parental reaction to smoking behavior (4.42 vs. 4.27; $p < .01$) and in parental self-efficacy (8.89 vs. 8.68; $p = .02$), with African American parents reporting stronger reactions to child smoking behavior and higher self-efficacy than the other racial groups.

In subgroup analysis of children by race, there were statistically significant differences in African American children compared with Whites and other races in parent-child communication about smoking (3.88 vs. 3.59; $p < .01$) and child intention to smoke (1.15 vs. 1.07, $p = 0.02$), with African American children reporting higher communication and higher intention to smoke than other racial groups. There were statistically significant differences between White children and children of other races compared with African American in perceived parental reaction to smoking behavior (4.53 vs. 4.36; $p < .01$) and child self-efficacy (4.51 vs. 4.35, $p = .01$), with children who were White or members of other racial groups reporting stronger parental reactions to child smoking behavior and higher self-efficacy to resist tobacco than African Americans.

In subgroup analysis of parents and children by income level, there were statistically significant differences in parents with low incomes (less than \$25,000/year) compared with parents with higher incomes on parent-reported parent-child communication (3.98 vs. 3.72; $p < .01$), child-reported parent-child communication (3.87 vs. 3.64; $p = .02$), and child intention to smoke (1.16 vs. 1.07; $p < .01$). Thus, there was higher reported communication by parents and children among low-income children than among higher-income children and higher intentions to smoke in low-income children. There were statistically significant

differences in children with high incomes compared with children with low incomes on parental reaction to smoking behavior (4.49 vs. 4.38; $p = .04$) and child self-efficacy (4.49 vs. 4.34; $p = .04$), with higher-income children reporting stronger parental reaction to smoking behavior and higher self-efficacy to resist smoking than lower-income children.

Finally, in subgroup analysis by parental smoking status, parental smokers had higher scores on parent-child communication compared to nonsmokers (4.0 vs. 3.73; $p < 0.01$) and their children had increased intention to smoke in the future compared to children of nonsmoking parents (1.17 vs. 1.08; $p = 0.03$).

Intervention acceptability

Overall, intervention parents highly endorsed the intervention; 81% gave the intervention an overall rating of 8–10 on a ten-point scale. We grouped participant responses of “agree or strongly agree” that the intervention provided them with “useful information” (96%) and “easy to understand” advice (98%); advice was sufficient and met their needs (94%); and length was “just right” (91%). Approximately 96% stated that the PED is a “good place to show this video and give advice about preventing smoking in children,” and 98% stated that they would “recommend this intervention to a friend/family member.”

Practitioners in the PED were supportive of incorporating the intervention into routine PED practice with 97% of practitioners indicating that the intervention did not “interfere with clinical care” and 96% indicating that the intervention length was “just right.”

Discussion

To our knowledge, this study represents the first to incorporate the delivery of a tobacco prevention intervention into the PED setting. Our results provide insights about the feasibility of recruitment, implementation, and acceptability of using this intervention in the busy PED setting. These insights can be used to assist clinicians and researchers who are interested in incorporating similar public health prevention interventions into the PED or similar settings. Our prior PED-based work and that of researchers in the adult emergency department (ED) setting, has shown that the ED may represent a unique and effective opportunity to intervene with parents and/or children in the area of tobacco cessation and prevention.^{19–22,42–45} Researchers have demonstrated that the ED provides a suitable venue in which to screen and provide interventions for alcohol use, HIV, and domestic violence.^{46–49} Our study demonstrated the feasibility of recruitment and incorporation, and acceptability among parents and health care providers.

Recruitment

We were able to recruit and enroll 82% of eligible parent/child dyads. These rates supersede prior participant recruitment rates of 30–70% cited in other ED based tobacco trials.^{43,50–52} Our high recruitment rate suggests that parents are receptive to receiving this type of intervention in the PED setting. We believe that the AAP recent policy statement that exhorts clinicians who care for children to intervene with parents and children to prevent the pediatric morbidity associated with tobacco initiation and use¹³ should include the delivery of such interventions in the PED setting. Given the high prevalence of parental smoking in

this setting, the use of the PED by a large proportion of disadvantaged families who may have poor access to primary care, and the long PED wait times,^{20–22,35,36,53} we encourage researchers to further study how this setting can be used as a venue to deliver tobacco prevention interventions.

Incorporation of the intervention and acceptability

A priority in developing and using this intervention was to ensure that it was feasible to incorporate the delivery of it into the non-urgent PED visit without interfering with clinical care. Since the DVDs were only five to seven minutes long, they did not interfere with the PED visit, especially given that median PED visit times are 133 minutes.⁵³ In addition, over 95% of practitioners reported that the intervention did not interfere with clinical care. Furthermore, the overwhelming majority of parents found the intervention acceptable, with 96% reporting that the PED visit is a “good time to provide such an intervention.” This study adds to the literature by demonstrating that the PED increases the reach of prevention interventions, and adds credence to the potential “teachable moment” in this setting.

Parent/child baseline assessment

Similar to our prior work in which we found a high prevalence of parental smoking of up to 47%,^{20–23} we found a current smoking rate of 28.8% in parents who bring their children to the PED, which is almost twice the prevalence of smoking in the U.S.⁵⁴ These data underscore the importance of the PED as a venue in which to intervene with parents and children to prevent tobacco use. In addition, our subgroup analyses provide further support for research that has found stronger parental reactions to child tobacco use and higher parental self-efficacy to prevent smoking in African American parents compared with other races.^{31,55} The findings of higher parent-child communication about tobacco in lower-income parents and in parents who smoke is encouraging; however, it is worrisome that children who were African American, lower-income, and whose parents smoked also had higher intentions to smoke. These findings underscore the need to continue to conduct research to develop parental tobacco prevention interventions to help low income parental smokers prevent tobacco use in their children.^{29,31,32,56}

In our sample, children (mean age of 11.5 years) reported low intentions to smoke, which is similar to those found in other studies of younger children.^{57,58} In addition, parents reported high anti-smoking self-efficacy and high frequency of parent-child communication about tobacco than we expected. These results may be due to the fact that our data was obtained from parents whose children had not initiated smoking, and these parents may feel more capable or empowered to prevent their child’s tobacco use compared to parents whose children have already begun to smoke.¹¹ However, these parents should be encouraged to continue their strong anti-smoking practices and attitudes.

Our study has several limitations. First, we recruited a convenience sample which was drawn from a Midwestern, tertiary care PED. Thus, participants may not be representative of all parent/child dyads. Specifically, 36% of parents were low-income, and there was a higher prevalence of smoking than the general population, thus limiting generalizability. Even though data collection was limited to study staff availability, this was not viewed as critical

as there is little reason to suspect that parental smoking prevalence varies by time.⁵⁹ Second, because the questionnaire was completed in the PED, there may have been under-reporting of smoking behavior⁶⁰ and over-reporting of communication and/or self-efficacy by parents or children due to social desirability pressures present in the hospital setting.⁶¹ However, despite the low rates of child smoking intentions and the high perceived parent/child self-efficacy, given the high prevalence of parental smokers in our sample, it is likely that children in this population are more at risk to initiate smoking in the future since parental smoking often predicts child tobacco use.^{29,62} Therefore, there is a strong need to intervene in the PED setting to prevent child smoking initiation. Reinforcing the positive parental anti-smoking behaviors that are already present in the homes with brief, supportive interventions such as IMPACT, may be a good start.

In conclusion, the PED may be an opportune setting to incorporate tobacco prevention and other public health prevention interventions to parents and children. The IMPACT intervention was feasible and acceptable to both parents and PED practitioners. Given the high prevalence of parental smoking and risk that children in this population will initiate smoking in the future, further work is needed to determine the effects of such interventions on decreasing tobacco initiation.

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Table 1**MEASURES AND SAMPLE QUESTIONS FROM THE BASELINE ASSESSMENTS**

MEASURES	Sample Questions	# Q's	Cronbach's Alpha: Parent	Cronbach's Alpha: Child
Frequency of parent-child anti-smoking communication (P,C)	"How often did your parent say: Smoking is not cool."	7	0.88	0.87
Parental reactions towards smoking behavior (P, C)	"What would happen if your parent found out that you had smoked just once?"	7	0.72	0.74
Parental anti-smoking self-efficacy (P)	"How confident do you feel that you could prevent your child from smoking?"	7	0.88	N/A
Youth self-efficacy to resist smoking (C)	"I could refuse to smoke if asked by my best friend."	8	N/A	0.90

Notes: Q = questions P = Parent questions C = Child questions N/A: Not Applicable

Table 2**CHARACTERISTICS OF ENROLLED PARENTS AND CHILDREN**

	Parents	Children
N	520	520
Gender-male	44 (8.46%)	242 (46.54%)
Mean Age(SD)	38.57 (7.14)	11.50 (1.11)
African American	225 (43.27%)	232 (44.62%)
H.S. Graduate	505 (97.12%)	N/A
Annual Income <\$25,000	188 (35.15%)	N/A
Regular smoker—parent	150 (28.85%)	N/A
Frequency of Anti-smoking Communication(mean, SD): Range: 1–5	3.81 (0.95)	3.72 (1.05)
Parental reaction to smoking behavior: mean(SD) Range: 1– 5	4.33 (0.58)	4.45 (0.59)
Parental anti-smoking self-efficacy: mean(SD) Range: 1– 10	8.77(1.07)	N/A
Child self-efficacy: mean(SD) Range: 1–5	N/A	4.43(0.73)
Child Intention to Smoke: mean(SD) Range: 1–5	N/A	1.10(0.31)

H.S. = High School SD = Standard Deviation