Addressing Environmental Smoke Exposure During Pediatric Hospitalization: Attitudes and Practices of Pediatric Nurses Versus Respiratory Therapists

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BACKGROUND: Tobacco smoke exposure leads to numerous adverse health effects in children. Providing cessation interventions to caregivers who smoke during pediatric hospitalizations can help protect children from such exposure. Both pediatric registered nurses (RNs) and pediatric respiratory therapists (RTs) are well positioned to provide these interventions. Little is known about their rates of participation in cessation efforts. Our objective was to compare the attitudes and practice of pediatric RNs versus pediatric RTs to evaluate their relative cessation-intervention practices in the in-patient pediatric setting. METHODS: An online survey was sent to pediatric RNs and RTs at 4 tertiary pediatric hospitals in California. The survey assessed individual demographics, work environment, experience, beliefs, and practices related to smoking cessation activities. Questions used 3-point and 5-point Likert scales and were compared with the chi-square test. Institutions with a response rate < 20% were excluded. RESULTS: A total of 401 respondents were included in the final analysis (292 RNs, 109 RTs). RTs versus RNs were older (42.0 y vs 35.4 y, respectively, $P < .001$) and more likely to be former smokers (29.9% vs 13.3%, respectively, $P < .001$). RNs reported lower levels of confidence in discussing smoking cessation with parents, with 11.7% saying they felt "very confident" compared to 29.0% of RTs ($P < .001$). RNs also reported screening for smoke exposure less frequently than RTs, with 18.8% responding "often" or "always" compared to 28.9% of RTs ($P = .033$). RNs had lower rates of advising parents "to make a smoke-free home policy" compared to RTs (ie, 13.4% vs 26.9%, respectively, $P = .002$). CONCLUSIONS: Compared to in-patient pediatric RNs, RTs reported higher rates of confidence in providing cessation interventions, screening for smoke exposure, and counseling on reducing smoke exposure, suggesting that they may be better positioned for intervening. These results can inform the design of an in-patient cessation intervention for caregivers of hospitalized children. *Key words: tobacco smoke pollution; screening; pediatric hospital; in-patient; nurse; respiratory therapist.* [Respir Care 2021;66(2):275–280. © 2021 Daedalus Enterprises]

Introduction

Environmental tobacco smoke exposure leads to numerous well-known adverse effects in children, including increased risk of sudden unexpected infant death syndrome,[1,2] increased severity of bronchiolitis infections, increased prevalence and severity of asthma, increased risk for and severity of other respiratory illnesses, and increased rates of middle-ear infections.[3] Many of these adverse events result in pediatric hospitalizations. Intervening in the out-patient pediatric setting among adult caregivers who smoke has been recognized as an opportunity to protect

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children from tobacco smoke.[4] While tobacco cessation interventions in the adult in-patient setting have shown promise[5] and are increasingly common,[6] interventions for parents in the in-patient pediatric setting are more limited and have largely focused on referral to state quit lines.[7,8] Recently, Sweeney et al[9] described a smoking cessation program in the in-patient pediatric setting that used respiratory therapists (RTs) to provide smoking-cessation interventions to patients and their caregivers.

To date, the evidence pertaining to which pediatric care providers are best positioned to provide effective tobacco cessation interventions in the in-patient pediatric setting is limited. Given their regular contact with every patient, registered nurses (RNs) are one option. In 2011, Geller and colleagues[10] reported results of a survey of > 800 in-patient pediatric RNs who characterized their participation in smoking cessation-related activities in the hospital: 43% reported screening for household smokers, while 57% of respondents reported they were not trained to discuss smoking cessation with adults; 29% of RNs counseled on the dangers of secondhand smoke exposure, and 25% counseled on smoke-free home policies.[11]

Pediatric RTs may also be well suited to provide smoking-cessation interventions. RTs have regular contact with patients with lung diseases that can be the result of or worsened by secondhand smoke exposure. RTs also report consistent training in tobacco interventions.[12] Respiratory illnesses are the leading cause of hospitalization in pediatric patients[13] and thus a high proportion of children may have contact with an RT during their in-patient stay.

Although the in-patient pediatric setting could offer an ideal opportunity to provide comprehensive tobacco-cessation interventions for parents of children admitted to the hospital, little is known about who should provide those interventions and the most effective interventions to offer. The objective of this study was to compare the attitudes and practice of pediatric RNs versus pediatric RTs to determine who may be better prepared to provide effective cessation interventions in the in-patient pediatric setting. The ultimate goal is to help inform the design of a comprehensive pediatric in-patient tobacco-cessation intervention.

QUICK LOOK

Current knowledge

Environmental tobacco smoke exposure is associated with many adverse health effects in children. The in-patient pediatric setting is recognized as an opportunity to provide comprehensive tobacco-cessation interventions for parents of children admitted to the hospital, although this practice is uncommon.

What this paper contributes to our knowledge

Compared to in-patient pediatric RNs, RTs reported higher rates of education in smoking cessation and more confidence in discussing smoke exposure. RTs also had significantly higher rates of screening for tobacco smoke exposure and more frequent cessation interventions such as counseling on harms of smoke exposure and advising on ways to reduce smoke exposure and to quit smoking.

Methods

Study Design

In November 2017, a descriptive online survey using Qualtrics (Provo, Utah) consisting of 45 questions was sent via institutional e-mail list-serves to in-patient RNs and RTs at 4 children's hospitals across the state of California (Rady Children's Hospital, San Diego; UCLA Mattel Children's Hospital, Los Angeles; UC-Davis Children's Hospital, Sacramento; and UCSF Benioff Children's Hospital, San Francisco). Recipients were invited to participate by completing this survey via an e-mail from an investigator at each site. Participants were given 3 weeks to do so and were not provided an incentive for participating. Invitees were sent weekly reminders to increase the response rate. Survey questions were modeled after the 2008 survey used by Geller et al[10] and Blaine et al[11] and took an estimated 10 min to complete. Survey questions were largely unchanged aside from making questions applicable to both RNs and RTs, given that the original questions were targeted toward nurses only. Three new questions with yes/no responses were added to the survey: "I have received formal training/education in smoking cessation"; "I would like to be able to refer parents who smoke directly to the smokers' quit line without a physician signature"; and "I would like to receive additional training on smoking cessation." Institutional review board approval was obtained through the University of California-San Diego, University of California-Los Angeles, University of California-San Francisco, and University of California-Davis.

Measures

Individual demographic questions assessed gender, age, work environment characteristics (ie, hospital location, unit-type), years as a pediatric RN or RT, tobacco use

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history, and personal history of formal training in tobacco cessation. Differences between RNs and RTs on demographic questions were assessed with *t* tests for continuous variables and with chi-square tests for categorical variables. For all questions pertaining to attitudes and practice, the term "parent" was defined to refer to any "parents, guardians, or caregivers who care for the child." Cessation-intervention attitudes were assessed by having RNs and RTs rate their "confidence in discussing smoking cessation with parents" on a 3-point response scale (not at all confident, somewhat confident, very confident) with responses compared with chi-square tests. Additional attitude questions assessed when cessation activities should be performed in the hospital and whether participants desired additional training in smoking cessation.

Perceived barriers to helping parents with smoking cessation plans were also evaluated (eg, parental resistance to cessation discussions, lack of time and place to discuss, short hospital stays, lack of training on discussing cessation, lack of easily accessible information, lack of standard of care, lack of information in appropriate language and reading level, and difficulties in changing hospital policy). Respondents were asked to identify barriers as major, moderate, minor, or not a barrier. Responses were dichotomized to major/moderate or minor/not a barrier and compared with chi-square tests.

Tobacco-cessation practice was assessed using a 5-point Likert scale (never, rarely, sometimes, often, always) to assess rates of screening for environmental tobacco smoke exposure (eg, household members, in-home exposure, and in-car exposure); counseling (eg, advising parents to adopt a smoke-free home or car policy, advising them to quit, assisting with their quit plan, suggesting use of nicotine-replacement therapy); and referral to the state tobacco quit line. Responses to the cessation practice questions were dichotomized to reflect either never/rarely/sometimes (coded as 0) or often/always (coded as 1) and compared with chi-square tests.

For all analyses, we included respondents who provided a response for a given question even if the respondent did not respond to all questions in the survey. The a priori alpha level for all *t* tests and chi-square analyses was set at 0.05.

Results

The survey was emailed to 2,086 individuals at 4 institutions (1,671 in-patient pediatric RNs and 415 in-patient pediatric RTs). A total of 460 respondents consented to the study; 8 did not complete any further questions and were excluded. An additional 23 respondents were excluded because they did not work as either a bedside RN or RT. Response rates at 2 of the 4 institutions were $< 20\%$, thus the 28 respondents from those institutions were excluded.

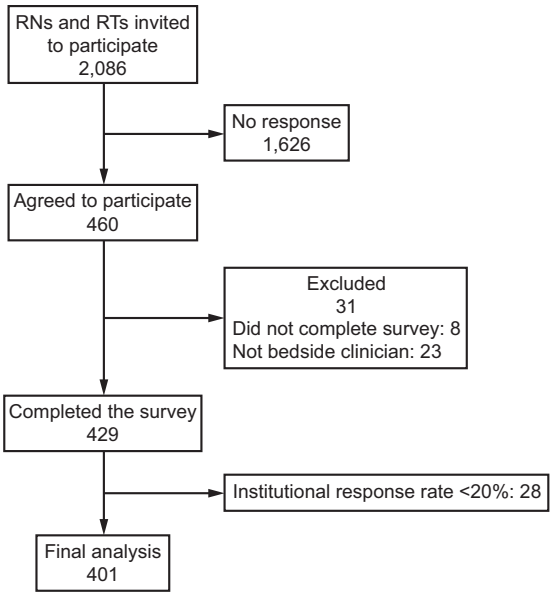

Fig. 1. Flow chart. RN = registered nurse, RT = respiratory therapist.

The remaining 401 individuals who responded from the other 2 institutions (response rates of 28% and 61%, $P < .001$) were included in the final analysis (Fig. 1).

Participant Demographics

Among the 401 survey respondents, 292 worked as pediatric RNs (17.5% response rate), and 109 worked as pediatric RTs (26.3% response rate) ($P < .001$). Of the RNs, 94.5% were female, whereas 54.1% of RTs were female ($P < .001$). Average age for RNs was 35.4 y compared to 42.0 y for RTs ($P < .001$). RNs reported working an average of 10.4 y as an RN versus RTs who reported working an average of 14.2 y ($P = .001$). Regarding smoking-cessation counseling education, 10.0% of RNs reported having received formal training compared to 31.4% of RTs ($P < .001$). Among RNs, 13.3% reported smoking at least 100 cigarettes in their lifetime compared to 29.9% of RTs ($P = .004$) (Table 1).

Attitudes and Practices

RNs reported lower levels of confidence in discussing smoking cessation with parents (32.3% not at all confident, 56.0% somewhat confident, and 11.7% very confident) compared with RTs (14.0% not at all confident, 57.0% somewhat confident, and 29.0% very confident) ($P < .001$) (Table 2). The majority of RNs (54.4%) and RTs (68.5%) reported that "during their hospitalization" was the most optimal time to discuss smoking cessation ($P = .02$). The least optimal time to discuss smoking cessation was "upon

Table 1. Participant Demographics

	Registered Nurses ($n = 292$)	Respiratory Therapists ($n = 109$)	P
Female, %	94.5	54.1	< .001
Mean age, y	35.4	42.0	< .001
Experience as registered nurse or respiratory therapist, y	10.4	14.2	.001
Formal education in smoking cessation, %	10.0	31.4	< .001
Current smoker, %	1.6	2.3	.67
Former smoker, %	13.3	29.9	< .001

Table 2. Comparison of Attitudes Regarding Smoking Cessation

	Registered Nurses ($n = 292$)	Respiratory Therapists ($n = 109$)	P
Confidence in discussing smoking cessation			< .001
Not at all	86 (32.3)	13 (14.0)	< .001
Somewhat	149 (56.0)	53 (57.0)	.87
Very	31 (11.7)	27 (29.0)	< .001
Most optimal time to discuss smoking cessation			.02
Upon admission	74 (28.1)	13 (14.1)	.007
During hospitalization	143 (54.4)	63 (68.5)	.02
At discharge	46 (17.5)	16 (17.4	< .001
Least optimal time to discuss smoking cessation			.95
Upon admission	131 (50.0)	44 (48.3)	.79
During hospitalization	27 (10.3)	10 (11.0)	.85
At discharge	104 (39.7)	37 (40.7)	.87
Wants additional training on smoking cessation	185 (74.3)	70 (81.4)	.18

Data are presented as n (%) respondents.

admission" (50.0% of RNs and 48.3% of RTs) ($P = .95$). Both groups also reported high rates of wanting additional training on smoking cessation (74.3% of RNs and 81.4% of RTs) ($P = .18$).

A majority of RNs (84.3%) and RTs (77.3%) reported "parents are resistant to discussions about smoking" as a moderate or major barrier to developing a tobacco cessation plan (Table 3). The majority of participants also identified "lack of a standard of care requiring this action" as a barrier (64.8% of RNs and 52.3% of RTs) ($P = .037$). RNs reported "I am not trained to discuss smoking cessation with adults" as a barrier more frequently than RTs (62.2% vs 38.6%, respectively) ($P < .001$). Overall, RNs identified all topics as major or moderate barriers more frequently than RTs (Table 3).

RNs reported screening parents for "household members who smoke" less frequently than RTs, with 18.8% responding often or always when asked about screening in the past 10 workdays compared to 28.9% of RTs ($P = .033$). RNs and RTs reported similar rates of having "ever had conversations about smoking cessation with patients' parents," with 55.3% of RNs and 62.8% of RTs reporting yes ($P = .21$). When asked about the last 10 workdays, RNs had lower rates of responding often or always when asked if they had advised parents to make a "smoke-free home policy" compared to RTs (13.4% vs 26.9%, respectively) ($P = .002$) or a "smoke-free car policy" (3.6% vs 17.3%, respectively) ($P < .001$). RNs also reported lower rates of "advising parents to quit" (6.4% vs 19.0%, respectively) ($P < .001$). Among RNs, 3.4% reported often or always when asked if they had referred a parent to a quit line or cessation service compared to 15.8% of RTs ($P < .001$) in the last 10 workdays (Table 4). High percentages of RNs and RTs reported they would like to directly refer parents who smoke to the smokers quit line without a physician's order (91.5% vs 84.9%, respectively) ($P = .08$).

Discussion

This study, which assessed attitudes and practices of RNs and RTs regarding counseling parents of in-patient pediatric patients, revealed that both groups of care providers were actively engaged in smoking-cessation activities as evidenced by the majority reporting having ever had conversations with parents about smoking cessation. However, compared to RNs, RTs reported significantly higher rates of screening for tobacco smoke exposure, higher levels of confidence in discussing smoking cessation, and more frequent cessation interventions such as counseling on harms of smoke exposure and advising on ways to reduce smoke exposure and to quit smoking. Each group appears invested in providing tobacco-cessation interventions given their similarly high rates of reporting "wanting more education" on the topic. Both groups rated "during the hospitalization" as the most optimal time to provide smoking-cessation interventions and "on admission" as the least optimal time.

Comparing our results to the study by Geller et al,[10] in which 43% of RNs asked about household smokers, RNs in our study had lower rates of routinely asking (18.8%). The reason for this difference is unclear, although it may be explained by a difference in confidence about smoking-cessation discussions, given that only 11.7% of RNs in our study reported being very confident in discussing smoking cessation compared to 24.7% of RNs in the study by Geller et al.[10] RNs in our study were consistent with the RNs from the study by Geller et al[10] in that both identified "parental resistance" and "short hospital stays" as the leading barriers to providing smoking-cessation interventions.

Table 3. Barriers to Providing Smoking Cessation Interventions

	Registered Nurses ($n = 292$)	Respiratory Therapists ($n = 109$)	P
Parents are resistant to discussions about smoking			.13
Moderate/major barrier	215 (84.3)	68 (77.3)	
Not a barrier/minor barrier	40 (15.7)	20 (22.7)	
Short hospital stays make it hard to develop relationship			.002
Moderate/major barrier	175 (68.6)	44 (50.0)	
Not a barrier/minor barrier	80 (31.4)	44 (50.0)	
Lack of standard of care requiring this action			.037
Moderate/major barrier	164 (64.8)	46 (52.3)	
Not a barrier/minor barrier	89 (35.2)	42 (47.7)	
It is hard to find a time and place to talk with parents			.02
Moderate/major barrier	156 (61.2)	41 (46.6)	
Not a barrier/minor barrier	99 (38.8)	47 (53.4)	
I am not trained to discuss smoking cessation with adults			< .001
Moderate/major barrier	158 (62.2)	34 (38.6)	
Not a barrier/minor barrier	96 (37.8)	54 (61.4)	
Lack of easily accessible information on smoking cessation			.14
Moderate/major barrier	130 (51.0)	37 (42.0)	
Not a barrier/minor barrier	125 (49.0)	51 (58.0)	

Data are presented as n (%) respondents.

Table 4. Tobacco-Cessation Practices: Screening, Counseling, Referral to Quit Line

	Registered Nurses ($n = 292$)	Respiratory Therapists ($n = 109$)	P
Ever had conversations with parents about smoking cessation, yes	147 (55.3)	59 (62.8)	.21
Screening in past 10 workdays (often/always)			
Household members who smoke	52 (18.8)	30 (28.9)	.033
Smoking inside the home	55 (19.9)	30 (28.9)	.060
Smoking in a car	14 (5.1)	16 (15.4)	< .001
Counseling in past 10 workdays (often/always)			
Counseled about effects of secondhand smoke on child	33 (11.9)	29 (27.9)	< .001
Advised to make a smoke-free home policy	37 (13.4)	28 (26.9)	.002
Advised to make a smoke-free car policy	10 (3.6)	18 (17.3)	< .001
Advised parent to quit	17 (6.4)	18 (19.0)	< .001
Suggested parent use nicotine replacement therapy	3 (1.1)	15 (15.8)	< .001
Referral to quit line or smoking cessation service (often/always)	9 (3.4)	15 (15.8)	< .001

Data are presented as n (%) respondents.

Compared to RNs, RTs in our study had higher levels of confidence in discussing smoke exposure, possibly due to their higher rates of cessation education, more relevant work experience, and higher rates of personal smoking history. Given that RTs work primarily with patients who have lung disease, they may also see a higher proportion of patients with smoke exposure compared to RNs, thereby increasing their experience and thus their confidence in working with this population.

Overall, both RNs and RTs in our study reported low rates of providing tobacco-cessation activities in the in-patient pediatric setting. Smoking cessation activities in the pediatric hospital have been recommended for many years,[6,14] although formal cessation programs are uncommon compared to adult in-patient settings. The low rates of cessation interventions for parents by pediatric staff highlight both a need and an opportunity for pediatric in-patient settings. Geller et al[10] reported that several factors can increase RN participation in cessation activities, including formal hospital policies that promote cessation activities, formal admission screening policies, hospital cessation plans for parents, and higher levels of RN confidence in discussing tobacco cessation. Such factors hold promise for RTs as well, who, according to our results, appear to be both better trained and more likely to deliver such interventions. While all clinicians should share the responsibility of

addressing tobacco use among parents of pediatric in-patients, our results particularly highlight the promise of RTs in increasing rates of such interventions.

Limitations

Our overall survey participation rate of 19.2% was unexpectedly low; as such, the generalizability of study results may be limited and open to question. Two of the 4 hospitals had very low participation and thus were eliminated from study analysis, potentially further decreasing the generalizability of our sample. Moreover, the survey was retrospective and might be subject to recall or expectancy bias.

Conclusions

Both RNs and RTs in this study reported encouraging smoking cessation among parents of children admitted to pediatric hospitals as well as a strong desire to receive more information on cessation efforts and formalized training. Results suggest that RTs have more education, confidence, and experience in providing smoking-cessation interventions, possibly highlighting this care provider as a particularly receptive target for policy, training, and other actions designed to increase such interventions. However, both RNs and RTs can serve as an integral part of a smoking-cessation program in the in-patient pediatric setting. Additional studies should focus on developing and testing a comprehensive smoking-cessation training program for RNs and RTs in pediatric hospitals. Results could inform next steps to help ensure pediatric patients are protected from the dangers of environmental tobacco smoke exposure by their parents.

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