ARTICLE

Pediatric Residents' Attitudes and Behaviors Related to Counseling Adolescents and Their Parents About Firearm Safety

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Background: Firearms continue to be a major cause of mortality in adolescence. Although the American Academy of Pediatrics strongly encourages pediatricians to counsel adolescents and their parents on firearm safety, few residency programs educate their trainees in this area. More in-depth information is needed to design effective educational interventions.

Objectives: To determine the attitudes, beliefs, and practices of pediatric residents regarding firearm safety counseling and to compare their counseling practices for adolescents and parents of adolescents during health maintenance visits.

Design: Cross-sectional survey.

Participants: Pediatric residents from 9 programs in the mid-Atlantic region.

Results: Of the 322 respondents (76% response rate), few believed that it is not a pediatrician's responsibility to counsel, that their patients are not at risk for firearm injury, and that children are safer with a gun in the home. However, only 50% reported routine counseling, and more than 20% reported almost never counseling adolescents and their parents on firearm safety. Barriers included inadequate training (38%), insufficient time (26%), and a lack of preceptor expectation (13%). The strongest predictors for counseling adolescents included the belief that gun-related media coverage influences counseling practice, level of training, and personal experience with guns in the home. The strongest predictors for counseling parents of adolescents were the belief in the media's influence on counseling practice, perceived counseling effectiveness, and discomfort with firearm safety counseling.

Conclusions: To increase counseling practices, clinical preceptors should aim to strengthen residents' comfort in counseling and to develop specific ways to enhance their perceived effectiveness in counseling parents.

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ALTHOUGH RECENT US data show a decrease in firearm-related mortality, firearms continue to be a significant threat to the lives of children and adolescents. In 1999, there were 1990 homicides, 1078 suicides, and 297 unintentional or undetermined firearm-related deaths in children 19 years old and younger. Eight-five percent of these fatalities occurred among individuals 15 to 19 years old.[1] Thirty percent to 40% of households contain firearms, and one third to half of these firearms are kept loaded, unlocked, and easily accessible.[2,3] A 1999 study found that more than 75% of the firearms used in youth suicides and unintentional shootings had been stored in the child's home or in the home of a friend or relative.[4] Because of the impulsive nature of many of these deaths, a significant proportion may have been prevented if firearms were stored appropriately.[5,6]

Promoting safe firearm storage is a national priority and is strongly encouraged by major health organizations. *Healthy People 2000* recommends the development of educational interventions to "convince parents to decrease their children's access to loaded firearms."[7(p237)] *Healthy People 2010* strengthened its objectives with the aim "to reduce the proportion of persons living in homes with firearms that are loaded and unlocked."[8(p15)] In April 2000, the American Academy of Pediatrics reaffirmed its previous recommendation urging pediatricians to counsel patients and families about firearm safety during health maintenance visits.[9] Although a recent study of practice-based firearm safety counseling failed to show a significant effect on parental gun safety behavior,[10] the educational intervention was a brief, one-time message that may not have successfully applied effective patient-physician communication strategies. Since pediatric health care providers continue to encounter families who store guns inappropriately,[3,11] they have a unique opportunity and responsibility to address this important issue.

Although pediatricians do believe they have a responsibility to educate parents on firearm safety,[12,13] and parents report being receptive to such counseling,[14,15] few pe-

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MATERIALS AND METHODS

QUESTIONNAIRE DEVELOPMENT

A 30-item questionnaire on attitudes, beliefs, and firearm safety counseling practices was developed and administered to pediatric residents. The questionnaire design was based on a conceptual framework, a review of the literature, previously used instruments,[13,18,21] and information obtained in 2 focus groups.

Guided by the Precede-Proceed Planning Model framework[22] and the Health Belief Model,[23] we developed a conceptual framework to characterize our hypothesized personal, interpersonal, and environmental factors influencing a pediatric resident's firearm safety counseling practice. Two focus groups were then conducted using prewritten, open-ended questions, and a facilitator-led discussion. The focus groups were composed of fourth-year medical students entering pediatric residency programs and graduating pediatric residents from The Johns Hopkins University School of Medicine, Baltimore, Md. We felt these groups would enable us to assess residents' beliefs prior to and at the completion of their residency training. Personal factors from the focus groups included the experience growing up with a gun in the home and beliefs about the importance of counseling. Interpersonal factors included preceptor expectations, while environmental factors included time constraints during visits and the availability of educational handouts. Questionnaire items were developed to measure these concepts as well as previously identified determinants from studies of pediatricians and resident physicians.[11,13,24]

The questionnaire collected demographic information about each participant, as well as clinical experience with firearm-related injury and perceived counseling effectiveness. Residents were asked to report their frequency of anticipatory guidance counseling on several age-specific topics recommended by *Bright Futures*[25] and the American Academy of Pediatrics.[26] Age-specific items were used since the content, style, and frequency of counseling for patients and parents are likely to vary for different-aged children. Several focus group members commented on the challenges of adjusting their counseling style for children and adolescents, compared with counseling for parents. Therefore, we assessed counseling frequency during adolescent visits separately for adolescents and parents of adolescents. Adolescents were defined as children 12 years or older. For each topic, counseling frequency was defined as the proportion of adolescents and parents the residents report counseling during routine health maintenance visits. Responses to these counseling frequency items were based on a 5-point ordinal scale, ranging from "almost never"(1) to "almost always" (5). In addition, questionnaire items assessed the residents' agreement with 16 statements based on our hypothesized determinants. After the questionnaire was developed, it was piloted with 6 recent pediatric residency program graduates. Prior to study implementation, approval was obtained from the institutional review board of The Johns Hopkins University School of Medicine, as well as other institutions as necessary.

SURVEY ADMINISTRATION

The principal investigator (B.S.S.) contacted residency directors of 12 pediatric programs in the mid-Atlantic region to invite their participation in the study. Nine residency directors agreed to participate. In most programs, pediatric residents rotate through a separate adolescent clinic

diatricians routinely provide this guidance to families.[13,16,17] One important barrier to counseling is the lack of education during residency training.[18] In a recent national survey of US pediatric residency program directors, only one third of the pediatric residency programs offered their residents formal training on firearm safety counseling. In residency programs without training, major barriers included the lack of educational materials and the absence of trained personnel.[19]

While prior studies have investigated practicing physicians' violence prevention screening,[12,18,20] to our knowledge, none has specifically addressed residents' firearm safety counseling practices during adolescent visits. Considering that adolescents are at a disproportionately greater risk than younger children, we felt a more in-depth evaluation was needed to identify the strongest determinants for counseling. This study investigates pediatric residents' attitudes, beliefs, and practices regarding firearm safety counseling and compares practices for adolescents and parents of adolescents during health maintenance visits. The results will be helpful for the design of resident educational interventions on firearm safety counseling.

RESULTS

Questionnaires were completed by 322 (76% response rate) of the 421 residents in 9 participating residency programs. **Table 1** summarizes the sample demographics. The median age of survey respondents was 28 years, and there was a fairly uniform distribution by level of training. Two thirds were female and most were white. Most reported their residency program was located in an urban setting and about one third plan to enter private practice after completion of their training.

The **Figure** compares firearm safety counseling practices among respondents during health maintenance visits for adolescents and parents of adolescents using the 5-point ordinal scales from the questionnaire. When the outcome variables were dichotomized for analysis and interpretation (responses 3-5), reported routine counseling rates for adolescents and parents of adolescents were 51% and 46%, respectively.

There was considerable variability in residents' responses to the questionnaire items related to firearm safety counseling. More than one third of the residents believed they have not been adequately trained to discuss firearm safety, and 32% did not think their advice would change a family's behavior regarding firearm removal from the home. Few residents (1%) believed their patients are not at risk for firearm injury, that children are safer with a gun in the home, and that it is not a pediatrician's responsibility to talk about guns. Twenty-eight percent of the residents reported growing up with a gun in the home and more than half have had clinical experience with firearm-

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in addition to maintaining a small panel of adolescent patients in their continuity clinic. The survey included categorical pediatric residents in these programs between February 5, 2001, and April 27, 2001. Questionnaires were mailed or hand-delivered to the director of each program. Either the program director or chief resident distributed, collected, and mailed back the completed questionnaires. At the program directors' discretion, residents completed the surveys in a group (eg, prior to a clinic conference) or during their free time. Confidentiality was assured and residents were offered a bookstore gift certificate as compensation for participating in the study.

DATA ANALYSIS

Our 2 primary outcome variables were the residents' reported frequency of firearm safety counseling for adolescents and for parents of adolescents during health maintenance visits. Since we aimed to examine differences in residents who counsel less frequently compared with those who counsel more routinely, the 5-point response scale (1 indicates almost never counsel; 2, sometimes counsel [approximately one quarter of the patients and/or their families]; 3, counsel half of the patients and/or their families; 4, usually counsel [approximately three quarters of the patients and/or their families]; and 5, almost always counsel) was dichotomized into responses of less than half (responses 1 and 2) and about half or more of their patients and/or their families (responses 3-5). For the remainder of the analysis and discussion, we define "routine firearm safety counseling" as counseling about half or more adolescents and/or their parents during health maintenance visits (responses 3-5). To assess responses regarding our hypothesized determinants, we used a 5-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5).

Survey responses were analyzed using Stata version 6.0[27] and SPSS version 10.0,[28] and descriptive statistics were used to characterize the study population. Our 16 questionnaire items related to firearm safety counseling were thought to be related to one another, which could lead to multicollinearity. To avoid this problem, principal component factor analysis with variance maximization rotation was used to identify sets of items with a high degree of intercorrelation that represent conceptually meaningful constructs. A factor loading cutoff of 0.4 was used and additive scales were developed for the 2 factors identified: discomfort in firearm safety counseling and perceived ineffectiveness in counseling ability. Both factor scales showed good inter-item correlation using the Cronbach α test of reliability ($\alpha > .7$). Questionnaire items that did not fall into these constructs were used as independent variables in the analysis.

Using binary logistic regression, each independent variable was evaluated for association with the 2 dependent variables related to routine firearm safety counseling. Generalized estimating equations enabled us to cluster the analyses to account for the lack of independence of observations within residency programs. Variables with association approaching statistical significance ($P < .10$) were then placed into 2 multivariate logistic regression models to identify the independent effects of our hypothesized determinants, controlling for all other variables. After regression models are developed, variance inflation factors are commonly used to detect multicollinearity among independent variables. If a model contains collinear predictors, the variance estimates are typically inflated. Variance inflation factors were used to assess collinearity of independent variables, with a cutoff of <10.

related injuries. More than one third believed that gun-related media coverage has motivated them to counsel, and only 13% believed their continuity clinic preceptors did not expect them to counsel. About half of the residents believed their continuity clinics lacked educational materials and 26% felt they did not have time to counsel.

At the bivariate level of analysis, many personal determinants were significantly associated with routine firearm safety counseling (**Table 2** and **Table 3**). Not surprisingly, residents who felt more discomfort and ineffective in their counseling skills were less likely to counsel routinely. The odds of counseling for residents who have a gun in the home, compared with those without a gun in the home, were about 50% less for counseling adolescents (odds ratio [OR], 0.47; 95% confidence interval [CI], 0.29-0.77) and almost 50% less for counseling parents (OR, 0.53; 95% CI, 0.30-0.93). Third-year residents were almost twice as likely as first-year residents to counsel adolescents routinely (OR, 1.9; 95% CI, 1.2-3.1), but this relationship did not persist for counseling parents.

The 2 hypothesized interpersonal factors—preceptor expectations and the belief that gun-related media coverage motivated the resident to counsel—were also significantly associated with counseling at the bivariate level. The only statistically significant environmental barrier to routine counseling was the perception of time constraints during well-child care visits. The odds of counseling for residents who agreed they do not have time to counsel were about 40% to 50% less than the odds for those who disagreed.

Table 4 summarizes the final multivariate models. The following 3 factors were independently associated with counseling for adolescents: level of training (third-year residents vs first-year residents: OR, 1.8; 95% CI, 1.04-3.2), personal gun-related experience (grew up with a gun in the home: OR, 0.67; 95% CI, 0.50-0.91), and the belief that gun-related media coverage has motivated the resident to counsel (OR, 1.8; 95% CI, 1.2-2.8). Factors associated with counseling parents of adolescents included perceived counseling effectiveness (somewhat vs not or little: OR, 3.6; 95% CI, 1.6-8.0; and very/extremely vs not or little: OR, 4.8; 95% CI, 2.1-10.9), discomfort in firearm safety counseling (OR, 0.77; 95% CI, 0.65-0.91), and the belief that gun-related media coverage has motivated the resident to counsel (OR, 1.6; 95% CI, 1.02-2.5). Collinearity did not exist among independent variables in the multivariate models (all variance inflation factors <10).

COMMENT

Since 1992 the American Academy of Pediatrics has published recommendations strongly encouraging pediatricians to counsel families about firearm safety, but counseling practices continue to lag behind. Our finding that

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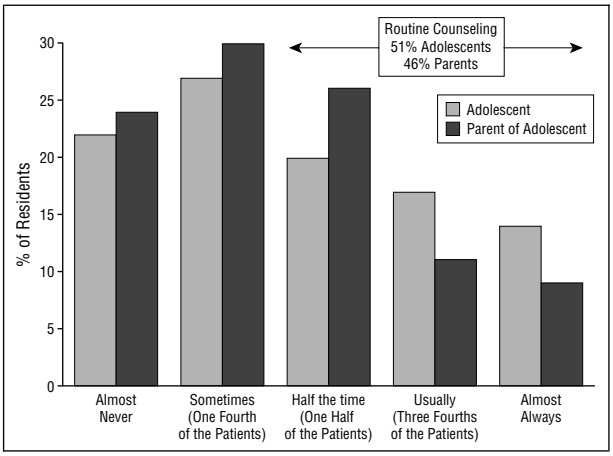
50% of residents routinely counsel adolescents and their parents is considerably greater than estimates found in prior studies.[17,18,24] Even so, we found that about 20% to 25% of residents almost never counsel in this area. While these numbers are somewhat disappointing, they should not be surprising. Residents attain their clinical knowledge and skills through formal education, informal teaching discussions, and faculty modeling.[29] Since only one third of pediatric residency programs educate their trainees about firearm safety counseling,[19] it is understandable that residents

Table 1. Characteristics of 322 Surveyed Residents*

Variable	Value
Median age (range), y	28 (22-44)
Residency year	
First	115 (36)
Second	99 (31)
Third	108 (33)
Female	215 (67)
Continuity site	
Urban	233 (74)
Suburban	11 (3)
Other	71 (23)
Career plans	
Private practice	105 (33)
Fellowship	84 (26)
Military	48 (15)
Hospitalist	11 (4)
Community health	10 (3)
Other	60 (19)

*Data are given as number (percentage) of respondents unless otherwise indicated.



Frequency of firearm safety counseling during adolescent health maintenance visits.

Table 2. Bivariate Predictors of Routine Firearm Safety Counseling for Adolescents

Variable	No. (%) of Residents: Who Do Counsel (n = 161)	No. (%) of Residents: Who Do Not Counsel (n = 150)	Odds Ratio (95% Confidence Interval)
Personal factors			
I believe that children are safer with a gun in the home.*	1 (1)	1 (1)	0.95 (0.64-1.4)
It is not a pediatrician's responsibility to talk about guns.*	1 (1)	1 (1)	0.95 (0.05-16.8)
The patients I see are not at risk for firearm injury.*	0	4 (3)	†
There are more important topics to discuss than firearms.*	29 (18)	38 (25)	0.62 (0.44-0.89)
Personal gun-related experience			
Grew up with a gun in the home	38 (24)	50 (33)	0.62 (0.42-0.92)
Currently has a gun in the home	12 (7)	22 (15)	0.47 (0.29-0.77)
Clinical experience with gun injury or death			
None	61 (38)	68 (45)	1.0
Participated in the care of a gun-injured child	67 (42)	58 (39)	1.3 (0.81-2.2)
Participated in the care of a child killed by a gun	33 (20)	24 (16)	1.6 (0.77-3.2)
Year of residency			
1st	46 (29)	61 (40)	1.0
2nd	53 (33)	46 (31)	1.5 (0.8-2.9)
3rd	62 (38)	43 (29)	1.9 (1.2-3.1)
Perceived counseling effectiveness			
Not or little effective	20 (12)	30 (20)	1.0
Somewhat effective	111 (69)	103 (70)	1.6 (0.77-3.4)
Very or extremely effective	30 (19)	15 (10)	3.0 (1.01-9.0)
Factor 1: Discomfort in firearm safety counseling‡	17 (11)	27 (18)	0.84 (0.73-0.97)
Factor 2: Ineffectiveness in firearm safety counseling‡	16 (10)	24 (16)	0.88 (0.81-0.95)
Interpersonal factors			
Media coverage of gun-related issues has motivated me to counsel on firearm safety.*	70 (43)	38 (25)	2.3 (1.5-3.6)
My preceptors do not expect me to counsel on firearms.*	13 (8)	26 (17)	0.42 (0.20-0.88)
Environmental factors			
My continuity site lacks handouts on firearm safety.*	73 (45)	77 (51)	0.77 (0.46-1.3)
I would counsel more if trigger locks were available.*	45 (28)	51 (34)	0.77 (0.39-1.5)
I do not have enough time to counsel about firearm safety.*	35 (22)	45 (30)	0.62 (0.43-0.90)

*Responses reflect those who agree or strongly agree.
†The number of subjects per group is too small to calculate the odds ratio.
‡Factor 1 (additive scale range 7-17, upper quartile 14-17) and factor 2 (additive scale range 3-15, upper quartile 11-15): the number (percentage) for counseling reflects the highest quartile for the 2 factors.

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Table 3. Bivariate Predictors of Routine Firearm Safety Counseling for Parents of Adolescents

Variable	No. (%) of Residents: Who Do Counsel (n = 144)	No. (%) of Residents: Who Do Not Counsel (n = 169)	Odds Ratio (95% Confidence Interval)
Personal factors			
I believe that children are safer with a gun in the home.*	1 (1)	1 (1)	1.2 (0.79-1.7)
It is not a pediatrician's responsibility to talk about guns.*	0	2 (1)	†
The patients I see are not at risk for firearm injury.*	0	4 (2)	†
There are more important topics to discuss than firearms.*	21 (15)	46 (27)	0.46 (0.25-0.84)
Personal gun-related experience			
Grew up with a gun in the home	35 (24)	53 (31)	0.70 (0.42-1.5)
Currently has a gun in the home	11 (8)	23 (14)	0.53 (0.30-0.93)
Clinical experience with gun injury/death			
None	53 (37)	77 (46)	1.0
Participated in the care of a gun-injured child	63 (43)	63 (37)	1.5 (0.83-2.6)
Participated in the care of a child killed by a gun	28 (20)	29 (17)	1.4 (0.73-2.7)
Year of residency			
First	42 (29)	65 (38)	1.0
Second	49 (34)	50 (30)	1.5 (0.86-2.7)
Third	53 (37)	54 (32)	1.5 (0.93-2.5)
Perceived counseling effectiveness			
Not or little effective	9 (6)	40 (24)	1.0
Somewhat effective	107 (74)	110 (65)	4.3 (1.9-10.0)
Very or extremely effective	28 (19)	17 (10)	7.3 (3.7-15.0)
Factor 1: Discomfort in firearm safety counseling‡	10 (7)	34 (20)	0.76 (0.65-0.90)
Factor 2: Ineffectiveness in firearm safety counseling‡	11 (8)	29 (17)	0.85 (0.79-0.92)
Interpersonal factors			
Media coverage of gun-related issues has motivated me to counsel on firearm safety.*	64 (44)	45 (27)	2.2 (1.5-3.2)
My preceptors do not expect me to counsel on firearms.*	11 (8)	29 (17)	0.39 (0.18-0.85)
Environmental factors			
My continuity site lacks handouts on firearm safety.*	69 (48)	83 (49)	0.95 (0.62-1.5)
I would counsel more if trigger locks were available.*	42 (29)	54 (32)	0.88 (0.47-1.6)
I do not have enough time to counsel about firearm safety.*	28 (19)	52 (31)	0.54 (0.35-0.84)

*Responses reflect those who agree or strongly agree.
†The number of subjects per group is too small to calculate the odds ratio.
‡Factor 1 (additive scale range 7-17, upper quartile 14-17) and factor 2 (additive scale range 3-15, upper quartile 11-15): the number (percentage) for counseling reflects highest quartile for the 2 factors.

do not routinely provide this type of guidance. In our study, although only 13% of residents believe their preceptors do not expect them to discuss firearm safety, 38% feel they have not been adequately trained to do so.

Various violence prevention curricula have successfully been integrated into residency programs and some have shown positive effects on residents' practices. Johnson et al[30] found that a one-time intervention led to a significant increase in the percentage of visits in which a resident discussed guns or violence. In an intervention study focusing on adolescent violence, Abraham et al[31] showed improved physician comfort and violence screening practices. In our study, we specifically focused on residents' attitudes, beliefs, and practices on firearm safety counseling to assist with the development of educational interventions. In our multivariate analyses, different factors predicted counseling for adolescents vs parents of adolescents. Taking a closer look at the actual factors, we suggest how different educational approaches might be used to promote counseling for these 2 audiences.

For counseling adolescents, third-year residents are more likely than first-year residents to discuss firearm safety, but this relationship does not persist for counseling parents of adolescents. Perhaps senior-level residents feel more comfortable than less experienced residents in addressing sensitive issues with teenagers. This difference may be related to the perception of greater counseling ability with a higher level of training. Prior literature does suggest that perceived counseling effectiveness is associated with physician counseling behavior.[32] To investigate this further we assessed residents' perceived effectiveness for counseling on firearm safety, as well as for counseling in general. Although perceived general counseling effectiveness is strongly associated with counseling parents, it is not a significant factor for counseling adolescents. This might be explained by the type of adolescent education residents receive. It has become common for residents to use structured frameworks for interviewing adolescents. These interviewing frameworks provide physicians with an organizational structure, often using mnemonics to guide the psychosocial history.[33] With such frameworks, perhaps more experienced residents develop greater comfort with the adolescent interview, regardless of their perceived effectiveness. Conversely, when discussing sensitive issues with parents, residents may be more aware of their counseling strategies, and perceived effectiveness may play a stronger role. An alternate explanation is that when resi-

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Table 4. Multivariate Predictors of Routine Firearm Safety Counseling During Adolescent Visits

Variable	Adjusted Odds Ratio (95% Confidence Interval)	
	Residents Who Counsel Adolescents	Residents Who Counsel Parents of Adolescents
Personal factors		
Perceived counseling effectiveness		
Not or little effective	1.0	1.0
Somewhat effective	1.3 (0.63-2.5)	3.6 (1.6-8.0)
Very or extremely effective	1.9 (0.77-4.9)	4.8 (2.1-10.9)
Year of residency		
First	1.0	1.0
Second	1.2 (0.66-2.3)	1.2 (0.74-2.1)
Third	1.8 (1.04-3.2)	1.4 (0.75-2.5)
Personal gun-related experience		
Grew up with a gun in the home	0.67 (0.50-0.91)	0.75 (0.48-1.2)
Currently has a gun in the home	0.54 (0.28-1.04)	0.59 (0.32-1.2)
Factor 1: Discomfort in firearm safety counseling*	0.85 (0.72-1.01)	0.77 (0.65-0.91)
Interpersonal factors		
Media coverage of gun-related issues has motivated me to counsel about firearm safety.†	1.8 (1.2-2.8)	1.6 (1.02-2.5)

*Factor 1 (additive scale range 7-17), higher value indicates greater discomfort.
†Value reflects those who agree or strongly agree with the statement.

dents are trained to use structured interview frameworks with adolescents, they assume the framework has been tested and is an effective communication tool. In applying these concepts to an intervention, educators may wish to focus on strengthening residents' perceived counseling effectiveness for parent encounters (eg, using role play) or perhaps incorporating similar frameworks into educational curricula for talking with parents.

Another personal factor associated with counseling adolescents, but not parents, is a resident's personal gun-related experience. In a survey in 1998, Barkin et al[17] found that gun-owning physicians are more likely to counsel on firearm safety than those without this experience. Although our preliminary focus groups supported this finding, our survey analysis revealed different results. Residents who grew up with guns in the home were less likely to report routine counseling than those without this experience. In addition to personal gun-related experience, clinical experience has also been shown to influence counseling practices, with greater physician experience associated with greater counseling frequency.[16] We found no such association for the 2 groups in our analyses. Residents who reported caring for children injured or killed by firearms are as likely as those without these experiences to counsel routinely. Without further information related to the nature of the residents' personal and clinical experiences, it is difficult to speculate on these findings. However, knowing that those residents with personal experiences are less likely to counsel, an educational intervention could include a discussion of this factor in an introductory needs assessment.

We found the same significant environmental factor for counseling both adolescents and their parents: the resident's belief that gun-related media coverage has motivated him or her to counsel. Residents with this belief are almost twice as likely to counsel routinely. In recent years greater media attention has been given to child and adolescent firearm-related deaths. Public service campaigns, such as ASK (Asking Saves Kids) have aired television advertisements urging parents to ask neighbors about guns in the home prior to sending their children over to play.[34] This increase in media attention could either be a reflection of or a facilitator for shifts in societal norms. As indicated in our study, this shift may already be positively influencing pediatric residents to provide counseling about firearm safety.

We recognize that there are several limitations in this study. Although confidentiality was assured, some residents may have been concerned that faculty might see their responses. If social desirability bias occurred, however, it would have probably favored residents reporting a greater frequency of firearm safety counseling, resulting in an overestimate for routine counseling. The residents' self-reported behaviors and beliefs may also have been influenced by the context in which the survey was administered. Although most residency programs distributed questionnaires individually, some administered the survey in a group setting (eg, prior to a lecture). In the group setting, time constraints and perceived colleague and preceptor expectations could have influenced the residents' responses.

Another important limitation relates to nonrespondent bias. Although we were able to survey a large proportion of the residents in the participating programs (76%), we do not have information on nonrespondents, whose counseling practices may differ. Again, if we assume that nonrespondents are less likely to counsel, our results would be an overestimate for residents who counsel routinely. In the interpretation of our findings we must also consider the generalizability of these results to pediatric residents excluded from the study population. Our sample included categorical pediatric residents training in 9 programs, mostly in the mid-Atlantic region. Although practices may vary by geographic region, the gender breakdown and career plans of our sample seem representative of pediatric residents nationally, with about two thirds being female and about one quarter entering careers in pediatric subspecialties.[35]

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What This Study Adds

One of the pediatrician's major roles in the prevention of youth violence is to counsel patients and families on firearm safety. Prior research has shown that counseling practices are discouragingly low, and few studies have specifically addressed this issue during pediatric residency training. Considering that adolescents have a relatively high risk of firearm-related mortality, residents should feel competent in providing firearm safety counseling for this population. To support the design of an educational intervention tailored to the needs of pediatric residents, we developed a theory-based questionnaire and conducted a cross-sectional survey in 9 mid-Atlantic residency programs. The major predictors for routine firearm safety counseling that are amenable to change included comfort with and perceived effectiveness in counseling. These factors should be considered in the design of educational interventions to promote firearm safety counseling.

CONCLUSIONS

Since residents do not routinely counsel adolescents and their parents on firearm safety, we greatly encourage residency programs to restructure existing curricula or develop new educational interventions in the area. To address the specific needs identified in our analyses, educators should aim to strengthen residents' comfort in counseling and enhance their perceived effectiveness in counseling parents. Although these key factors are related to counseling on firearm safety, we believe these principles could positively influence resident counseling for other sensitive topics.

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