Social Determinants of Pediatric Residents’ Injury Prevention Counseling

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Background: Social norms imparted by preceptors and the requirements necessary to pass American Board of Pediatrics’ examinations are potentially important contributors to physician behavior.

Objective: To explore the relationships between perceived professional norms regarding injury prevention and the injury prevention topics discussed, and counseling strategies employed, by pediatric residents.

Design: A self-administered survey.

Setting: All 5 North Carolina pediatric residency programs.

Participants: Physicians training in pediatrics or medicine-pediatrics in these programs (N=160, 72% response rate).

Main Outcome Measure: Correlation between perceived professional norms and self-reported content of injury prevention counseling and use of behavior change strategies.

Results: Although 95% of the pediatric residents reported counseling all or almost all parents with children younger than 1 year about car seat use, only 19% reported counseling this many parents about gun safety. Of the 7 behavior change strategies that residents were asked about, respondents were most likely to report “showing approval for safe behaviors” to all or almost all parents (78%). Two thirds reported asking all or almost all parents about the safety of their homes. Pediatric residents’ reported injury prevention counseling was correlated with their perceived professional norms regarding such counseling for most of the content areas and behavior change strategies.

Conclusions: Perceived professional norms regarding injury prevention are related to pediatric residents’ counseling. Preceptors should be aware that they transmit professional norms to residents. Also, the American Board of Pediatrics can increase residents’ attention to injury prevention by informing them that it will be a topic included in the board examination.


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JURIES ARE responsible for more than 1100 deaths among children younger than 1 year and 45% of the deaths among children between the ages of 1 and 4 years. Recognizing these facts, many national organizations encourage pediatricians to counsel parents about injury prevention.

During residency, pediatricians are expected to learn about the topics they should address in the preventive and acute care of children. Pediatric residency training programs impart knowledge of content areas (eg, normal child development) and skills in treatment and prevention methods (eg, strategies for counseling parents about injury prevention). Residency training programs also affect residents’ beliefs and attitudes toward the services they will routinely provide as pediatricians. Members of a group are motivated to perform the behaviors expected by their group. The medical profession as a whole, as well as each specialty area, socializes members to perform certain behaviors. Standards for practice, within specialties and within spe-
PARTICIPANTS AND METHODS

We used a 111-item self-administered questionnaire to collect information from all residents enrolled in the 5 North Carolina pediatric residency programs, including those in 4-year combined medicine-pediatrics programs. Questionnaires were mailed to the program directors or chief residents at 4 of the programs. This person distributed, collected, and mailed back the completed anonymous questionnaires, as well as those of residents who refused to participate. Residents in the fifth program were handed their questionnaire and an envelope by one of us (L.R.C.).

Drop boxes were placed in the residents' lounges to return these questionnaires. Residents in this program were assigned identification numbers linking their questionnaire data to research data collected as part of a larger study. Consequently, their responses were not anonymous.

The questionnaire design was based on a review of studies of physician knowledge, beliefs, and counseling behaviors and survey instruments on various topics, including childhood injury prevention,19 21 general disease prevention and health promotion in primary care,22 24 breastfeeding,25 domestic violence,26 firearms (D. W. Webster, ScD, MPH, unpublished data, 1989), and smoking cessation,27 and was pilot tested with 7 pediatric faculty members.

We asked residents to consider the 2 major components of parent counseling, content and behavior change strategies, and to indicate the proportion of parents with children younger than 1 year seen in the well-child clinic who they counseled about each of 8 injury content areas and with whom they employed each of 7 injury prevention behavior change strategies. Responses were based on 6-point Likert-type scales, from 1 (“none”) to 6 (“all”). Content included the injury prevention topics a counselor may cover with parents of children younger than 1 year: car seat use, installing outlet covers, smoke detector use, testing hot water temperature, use of baby walkers, safe bathing practices, safe discipline methods, and gun safety.

Strategies through which counselors attempt to bring about behavior change were drawn from the Health Belief Model14 28 30 but not identified as such to the respondents. These include asking parents about safety hazards in their homes and actions that might increase their child’s risk of injury and asking parents about their motivation to make specific changes and the barriers that might prevent parents from making these changes. Other strategies include showing approval for safe behaviors, explaining how to implement specific changes (eg, installing smoke detectors) and, when needed, referring parents to other professionals for help in reducing their child’s risk (eg, a community-based home visiting program that promotes parenting skills).

Perceived professional norms were measured for injury content and behavior change strategies. Perceived professional norms regarding injury content were assessed by examining the perceived likelihood of American Board of Pediatrics’ examination questions on 8 injury content areas, 4 of which had parallel counseling questions (car seat use, smoke detectors, hot water temperature, and gun safety). These were measured on 5-point scales, from 1 (“very unlikely”) to 5 (“very likely”). Perceived preceptor expectations for employing 8 injury prevention behavior change strategies were measured on 4-point scales, from 1 (“preceptors do not expect you to do this at all”) to 4 (“preceptors expect this to a great extent”). Five of the questions regarding perceived preceptor expectations for use of behavior change strategies had matching counseling questions (asking about the safety of the home environment, asking about specific things parents or other family members do that might cause injury risk to children, asking parents about their desire to change specific behaviors, asking parents about barriers to changing their behaviors, and explaining how to implement specific changes to prevent injuries).

For the 4 key content areas and 5 key behavior change strategies with parallel items in the counseling and perceived professional norms sections of the questionnaire, the magnitude of associations between perceived professional norms and reported injury prevention counseling was assessed using Pearson product moment correlation coefficients. Alpha was set at P≤.05 for a significant result.

Because male and female physicians hold different beliefs about preventive health services and counsel patients differently,31 32 we analyzed male and female responses separately and compared 95% confidence intervals around their Pearson product moment correlation coefficients to detect significant differences by sex.33 Previous research has also shown relationships between how physicians feel about counseling and their residency year, comfort conducting counseling, and confidence that counseling helps parents.18 31 34 36 These variables were controlled for separately by calculating Pearson partial product moment correlation coefficients.

cific clinical settings,16 can be powerful influences shaping physician behavior.

Another way a profession socializes its members is through testing. Board-certification examinations in pediatrics, internal medicine, and family medicine frequently include questions regarding preventive services or injury prevention counseling.17 18 Medical students’ and residents’ motivation to master these topics may be affected by what they believe will appear on the American Board of Pediatrics’ examinations.18

Residency program preceptors also transmit professional norms to their residents through their expectations regarding standard well-child care and through their demonstrations of how to counsel. Residents who perceive that their faculty preceptors believe that certain behaviors are important will feel social pressure to perform those behaviors.12 Therefore, norms can be expected to play a role in shaping counseling behavior.

Because counseling is the primary method through which pediatricians act to prevent injuries to their patients, pediatric residents’ perceptions of professional norms regarding injury prevention are likely to influence the counseling content they discuss and the counseling strategies they employ. This study explores the relationships between perceived professional norms regarding injury prevention and injury prevention counseling by pediatric residents. The results can help guide pediatric residency programs to advance the quantity and quality of injury prevention counseling.
A total of 160 pediatric residents from all 5 North Carolina pediatric residency programs (response rate, 72%) returned completed questionnaires. Sixty percent of the residents were women; the mean age of the residents was 29 years. The residents were mostly white (81%), and 73% did not have children. The largest proportion of respondents reported that they were in the first year of their pediatric residency (45%), with 27% in the second year and 28% in the third or fourth year. There were no statistically significant differences between respondents from the 5 residency programs for these variables.

Slightly more than half of the pediatric residents surveyed (54%) believed that talking to parents about injury prevention was very important. Only 19% thought that talking to parents about discipline at this age was very important. While most residents reported feeling comfortable counseling parents about injury prevention (83%), they reported feeling somewhat less confident that their counseling helps parents prevent injuries (63%) or that parents actually follow the advice they give (52%).

### INJURY PREVENTION COUNSELING CONTENT AND BEHAVIOR CHANGE STRATEGIES

Residents reported counseling different proportions of parents about each of the 8 injury topics examined (Table 1). Only 22% of the residents reported counseling all or almost all parents about 5 or more of the injury topics listed. Examining only those residents who report counseling all parents about each topic reveals an even sharper divide: 76% reported counseling all parents about car seats, whereas only 29% reported counseling all parents about testing the temperature of their hot water and 20% reported counseling all parents about smoke detector use.

Residents also varied in the extent to which they report using different behavior change strategies with the parents they see for well-child care (Table 2). Residents varied in the extent to which they reported counseling all parents about each topic listed. Because of rounding, some totals do not equal 100%. The scale was from 1 (none) to 6 (all).

### RESULTS

The table below shows the proportion of parents as reported by the residents who counsel all parents about each topic.

<table>
<thead>
<tr>
<th>Injury Prevention Topic</th>
<th>1 or 2</th>
<th>3 or 4</th>
<th>5 or 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car seat use</td>
<td>0.7</td>
<td>4.6</td>
<td>94.8</td>
</tr>
<tr>
<td>Installing outlet covers</td>
<td>14.3</td>
<td>24.6</td>
<td>61.1</td>
</tr>
<tr>
<td>Smoke detector use</td>
<td>19.0</td>
<td>23.5</td>
<td>57.6</td>
</tr>
<tr>
<td>Testing hot water temp.</td>
<td>13.6</td>
<td>33.1</td>
<td>53.2</td>
</tr>
<tr>
<td>Use of baby walkers</td>
<td>14.2</td>
<td>33.1</td>
<td>52.6</td>
</tr>
<tr>
<td>Safe bathing practices</td>
<td>17.5</td>
<td>37.0</td>
<td>45.5</td>
</tr>
<tr>
<td>Safe discipline methods</td>
<td>21.7</td>
<td>52.7</td>
<td>25.6</td>
</tr>
<tr>
<td>Gun safety</td>
<td>52.6</td>
<td>28.5</td>
<td>18.8</td>
</tr>
</tbody>
</table>

* Pediatric residents were asked, “Of the parents with children younger than 1 year whom you see in the continuity clinic, how many do you counsel about this specific injury prevention topic?”

†All data are given as the percentage of parents counseled about the specific injury prevention topic listed. Because of rounding, some totals do not equal 100%. The scale was from 1 (none) to 6 (all).

On average, residents were unclear about the likelihood of American Board of Pediatrics’ examination questions on the 8 injury topics listed, with almost one third choosing the middle response option for each topic (Table 3). Whereas almost half thought questions regarding playground safety were unlikely, almost equal proportions of residents thought questions on smoke detectors were likely as thought them unlikely. This was not the case for poisoning prevention, which most residents thought likely to appear on the American Board of Pediatrics’ examination.

Most residents thought that their preceptors expected to a great extent that they would ask parents about the safety of their homes; most residents also believed that their preceptors expected to a great extent that they would report parents to the Department of Social Services for behaviors they believe to be neglectful. However, only a few believed that they were expected to the same extent to refer parents to others who could help them reduce their child’s risk of injury (Table 4). Similarly,
few believed that they were expected to ask parents about their motivation to make changes to safeguard their child or about barriers that might prevent parents from making these changes.

**INJURY PREVENTION COUNSELING AND PERCEIVED PROFESSIONAL NORMS**

We examined correlations between reported injury prevention counseling and perceived professional norms for 4 of the content areas and 5 of the behavior change strategies. Pediatric residents' reported injury prevention counseling was correlated with their perceived professional norms regarding such counseling for all the behavior change strategies and all but 1 of the content areas (car seats). This relationship was strongest for the behavior change strategies, where $P \leq .001$ for all values. Correlation coefficients ranged from 0.38 for asking parents about the safety of their home environment to 0.54 for explaining how to implement specific changes to prevent injuries. The other 3 behavior change strategies examined (asking parents about specific things they or other family members do that might cause injury risk to their children, $r = 0.45$; asking parents about their desire to change specific behaviors to reduce their child's risk of injury, $r = 0.46$; and asking parents questions about things that might prevent them from making specific changes to reduce their child's risk of injury, $r = 0.46$) fell in the middle of this range.

Of the injury content topics, only the relationship between reported asking of parents about smoke detector use and the perceived likelihood of American Board of Pediatrics' questions on smoke detectors showed a correlation coefficient approaching those noted for the behavior change strategies ($r = 0.35, P \leq .001$). The next highest correlation coefficients were obtained for asking about gun safety ($r = 0.25, P \leq .01$) and asking about hot water temperature ($r = 0.17, P \leq .05$). The lowest, and only non-significant, correlation coefficient was obtained for reported asking of parents about car seat use and American Board of Pediatrics' questions regarding car seats ($r = 0.11, P > .05$).

When examined separately by sex, the described relationships between reported injury prevention counseling and perceived professional norms did not differ significantly ($P > .05$ for all) for men and women. Each correlation analysis was conducted 3 additional times to examine the primary relationship of interest after accounting for residency year, comfort in counseling, and confidence that one's counseling helps parents prevent injuries to their children. The Pearson partial product moment correlation coefficients were almost identical to those obtained in the first analysis and, therefore, are not presented.

**COMMENT**

Most pediatric residents report talking to parents to reduce their patients' injury risks. Reporting injury prevention counseling is correlated with perceiving that professional norms, and particularly preceptor expectations, encourage such counseling. This relationship is stable even when controlling for the effects of sex, residency year, comfort in counseling, or confidence that counseling has an effect on parental behavior.

Although there is some evidence that injury prevention counseling can help parents prevent childhood injuries, systematic controlled trials of prevention in-

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**Table 3. Pediatrics Residents’ Perceptions of the Likelihood of American Board of Pediatrics’ Examination Questions on Injury Topics (n=160)**

<table>
<thead>
<tr>
<th>Injury Topic*</th>
<th>Scale†</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 or 2</td>
</tr>
<tr>
<td>Poisoning prevention</td>
<td>6.4</td>
</tr>
<tr>
<td>Drowning prevention</td>
<td>16.8</td>
</tr>
<tr>
<td>Car seats</td>
<td>22.1</td>
</tr>
<tr>
<td>Hot water temperature</td>
<td>20.8</td>
</tr>
<tr>
<td>Bicycle safety</td>
<td>22.7</td>
</tr>
<tr>
<td>Gun safety</td>
<td>26.2</td>
</tr>
<tr>
<td>Smoke detectors</td>
<td>35.1</td>
</tr>
<tr>
<td>Playground safety</td>
<td>48.0</td>
</tr>
</tbody>
</table>

* Pediatric residents were asked, “How likely do you think it is that there are American Board of Pediatrics’ examination questions on the following topics?”
† All data are given as the percentage of pediatric residents who thought there would be examination questions on the specified injury topics. Because of rounding, some totals do not equal 100%. The scale was from 1 (very unlikely) to 5 (very likely).

**Table 4. Pediatric Residents’ Perceived Preceptor Expectations for the Use of Behavior Change Strategies in Injury Prevention Counseling (n=160)**

<table>
<thead>
<tr>
<th>Perceived Preceptor Expectations*</th>
<th>Scale†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask parents about the safety of their home environment</td>
<td>0.7</td>
</tr>
<tr>
<td>Report parents to the Department of Social Services for behaviors you believe are neglectful</td>
<td>2.0</td>
</tr>
<tr>
<td>Explain how to implement specific changes to prevent injuries</td>
<td>5.9</td>
</tr>
<tr>
<td>Ask parents about specific things they or other family members do that might cause injury risk to their child</td>
<td>1.9</td>
</tr>
<tr>
<td>Follow up on injury risks identified at previous visits</td>
<td>10.5</td>
</tr>
<tr>
<td>Ask parents about their desire to change specific behaviors to reduce their child’s risk of injury</td>
<td>11.8</td>
</tr>
<tr>
<td>Ask parents about things that might prevent them from making specific changes to reduce their child’s risk of injury</td>
<td>12.0</td>
</tr>
<tr>
<td>Refer parents to other agencies or organizations in their community that can help them reduce injury risks to their child</td>
<td>27.6</td>
</tr>
</tbody>
</table>

* Pediatric residents were asked, “Different programs have different ideas about what pediatric residents are expected to do. Do your preceptors expect you to use the following behavior change strategies?”
† All data are given as the percentage of pediatric residents who perceived that their preceptor expected them to use the behavior change strategies specified. Because of rounding, some totals do not equal 100%. The scale was from 1 (not at all) to 4 (to a great extent).
terventions are needed. It is clear that to be effective in changing parental behavior, injury prevention counseling must include a greater variety of behavior change strategies than those reported by our respondents. Counseling includes more than simply asking if a safety device is in use or if a problem exists. Instead, it includes assessing needs, understanding parents’ perspectives, and attempting to bring about behavior change by engaging parents in new ways of caring for their children. It seems that most pediatric residents ask parents about a few childhood injury risks and protective devices (eg, do you have a car seat?) and then praise them if they answer in a way that demonstrates appropriate safety practices. Not only do they seldom report showing disapproval for responses that indicate an increased risk of childhood injury, they report that they rarely delve into the deeper issues, such as desire to change or barriers to change, that are related to the unsafe situation. For injury prevention counseling to be effective, it should address these behavior change issues.

Injury prevention is a broad subject area, covering a wide variety of topics. Different injury types are associated with different rates of mortality and morbidity, and counseling should be prioritized to reflect this fact. The counseling reported by the residents is not clearly related to either morbidity or mortality. The importance of motor vehicle crashes as a cause of death and injury is reflected in the great extent to which the residents report counseling parents about car seat use. However, morbidity and mortality data about electrical injuries do not support the frequency with which parents are reportedly counseled about installing outlet covers. Similarly problematic, homicide is the leading cause of injury death for children younger than 1 year in the United States, but only one quarter of the residents report counseling all or almost all parents with children this age about safe discipline methods.

In contrast, pediatric residents’ reported injury prevention counseling seems to be strongly related to what they believe their preceptors expect. Preceptors act as role models, supervisors, and teachers. It has been noted that academic medical center faculty members tend to limit the time they spend with patients and that this tendency may discourage residents from counseling patients. Similarly, the results of this study show that the expectations that preceptors transmit to residents regarding injury prevention counseling are related to low use of behavior change strategies in injury prevention counseling. This lack of counseling skills training during resident education extends to all areas of preventive care and medical treatment. Preceptors need to be aware that what they say to residents and demonstrate in the clinic may have a profound effect on the counseling their trainees provide to patients in the future.

The American Board of Pediatrics plays a more peripheral role in the training of pediatricians. Although the board keeps the list of possible examination questions secret, there is a correlation between residents’ beliefs about the likelihood of injury topics appearing on the board examination and the counseling they report providing. American Board of Pediatrics’ examinations, like most residency programs, focus on diagnosis and treatment, not prevention. The findings of this study highlight an opportunity for the American Board of Pediatrics to shape the norms and practices of future pediatricians toward the prevention of childhood injuries.

The high perceived likelihood of poisoning prevention questions appearing on the American Board of Pediatrics’ examinations can be linked to the prevalence of poisoning-related questions in review books. One review book contains 50 questions on “accidents, poisoning, and drug abuse,” of which 17 address the diagnosis or treatment of poisoning; 14 address the diagnosis or treatment of drug abuse or overdose; 11 address the diagnosis or treatment of child abuse, lead poisoning, and other injuries; and only 8 address the prevention of child abuse, suicide, injuries due to motor vehicle crashes and other unintentional injuries. Similarly, of 700 questions in another review guide there are 16 questions on “accidents, poisonings, and environmental hazards,” of which 11 address the diagnosis or treatment of poisonings or ingestions. The authors and publishers of American Board of Pediatrics’ examination review books should take advantage of their apparent ability to influence the beliefs of future pediatricians and focus their attention on the prevention of those injuries responsible for the greatest proportions of childhood death and disability.

This study is limited in that the validity of self-reported counseling has not been established. Physicians have been shown to overreport, underreport, or correctly report their counseling, depending on the topic. Self-reported data reflect physicians’ perceptions of their counseling rather than actual counseling. Observational studies of injury prevention counseling should be used to validate self-reported information.

Another limitation of this study is the cross-sectional nature of the data. This limits our ability to determine the direction of the association between perceived professional norms and reported counseling. In addition, although similarities in question design may have played a role in generating significant (P < .05) correlations (response set bias), this is unlikely because we asked first about counseling behavior and later about preceptor expectations and the American Board of Pediatrics’ examination. This possible limitation was also minimized by using different length response option scales suited to each set of items: counseling questions had 6-point response option scales, whereas preceptor expectation questions had 4-point scales and American Board of Pediatrics’ examination questions had 5-point scales. Although the study sample was drawn from only 1 state, the respondents are representative of the population of US pediatric residents for sex and race, except that the North Carolina sample was more likely to be white. In the sample, 100% of medicine-pediatric residents were white vs 69% of medicine-pediatric residents nationwide; 77% of pediatric residents in the sample were white vs 56% in the pediatric resident population nationwide. Professional norms are obviously important to pediatric residents. Residency program directors,
individual preceptors, and the American Board of Pediatrics should be aware of this and make concerted efforts to shape the beliefs, norms, and practices of future members of the profession. Program directors could emphasize the importance of learning how to counsel in addition to learning about content. To do this, preceptors may need to be provided with additional training in preventive counseling strategies. Professional organizations could educate their members about the role their perceived expectations play in forming the beliefs and practices of residents. Pediatric residents receive mixed signals about the importance of injury prevention. Although the American Academy of Pediatrics actively promotes injury prevention, the lack of support for injury prevention counseling, for example, through reimbursement, sends a signal to physicians that this is not an expected component of medical care. For injury prevention to be embraced as an integral part of pediatrics, consensus must be achieved at the national level and among the preceptors in each residency program. Then, the value placed on this topic by faculty can be transmitted to the next generation of pediatricians.

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