Child Abuse Training, Comfort, and Knowledge Among Emergency Medicine, Family Medicine, and Pediatric Residents

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Abstract

Purpose: To assess the training, comfort, and knowledge related to the medical management of child abuse among emergency medicine, family medicine, and pediatric residents.

Method: In 2004, a 25-item survey was distributed to 274 pediatric, emergency medicine, and family medicine residents at two medical schools in Norfolk, Virginia and Dallas, Texas. Analyses focused on identifying differences in training, comfort, and knowledge by specialty and site, and identifying factors associated with greater knowledge and comfort.

Results: Pediatric residents reported receiving the most hours of instruction in child abuse during residency. Training experiences of family medicine residents differed significantly by site. Clinical and overall knowledge and comfort with handling exams correlated strongly with the number of abuse patients seen during residency. On both clinical and overall knowledge, family medicine residents performed significantly worse than pediatric and emergency medicine residents. Knowledge of genital anatomy and comfort with sexual abuse exams was poor among all specialties.

Conclusion: The results support the need for improvements in and a more systematic approach to residency training in child abuse.

Child maltreatment remains the leading cause of injury death among infants and children younger than five years of age. In 2004, approximately 872,000 children were determined to be abused or neglected in the United States, with physical abuse accounting for 18% and sexual abuse accounting for 10% of all reported cases. An estimated 1,500 of these abused children ultimately died from their injuries. Since the diagnosis of child maltreatment entered the medical literature in 1962, physicians have become important resources in the management of child abuse. Children suspected of being abused or neglected are now regularly referred to medical professionals for forensic examination and diagnosis. According to the American Academy of Pediatrics, 66% of pediatricians reported treating injuries from child abuse in 2003, a 12% increase since 1998. Physicians in every state of the U.S. are legally required to report suspected abuse and often are called upon by courts as expert witnesses. In 2003, medical personnel were responsible for 8% of all referrals to Child Protective Services, although research suggests many suspected cases seen by medical professionals are never reported.

Although the number of physicians specializing in child abuse has increased, availability and distribution of these specialists throughout the United States remains limited. Consequently, physicians without specialized training in child abuse are usually the first professionals to encounter a child who may have been abused or neglected. However, studies have revealed evidence of under-reporting, over-reporting, and patterns of misdiagnosis by such nonspecialist physicians and residents in the medical management of child abuse. These inconsistent patterns have been attributed to various factors, including physicians’ prior experience with child protective services, amount of continuing medical education, discomfort with sexual topics, attitudes toward discipline, and residency training. The quality of residency training in child maltreatment has received the most attention, but studies on this topic have crucial limitations.

First, prior studies of residency training and knowledge of child maltreatment have involved multiple specialties, but to our knowledge no study has compared the training and knowledge among residents in the three medical specialties most likely to first encounter abused children: pediatrics, emergency medicine (EM), and family medicine (FM). A second limitation is that prior assessments of residents’ knowledge have focused exclusively on either physical abuse or sexual abuse, despite the likelihood that residents will encounter both types of cases in the course of their career. A third limitation is that the previous methods used to assess child
abuse knowledge among resident populations have not included clinical vignettes, despite their proven reliability and validity, their frequent use as teaching tools in medical education, and their ability to assess clinical judgment rather than rote knowledge.

To better understand the differences in training, comfort, and knowledge among these three specialties, we surveyed pediatric, EM, and FM residents from eight residency programs at two institutions. Our objective was to assess residents’ level of didactic and clinical training, comfort, and knowledge related to the assessment of physical and sexual abuse, and to identify those factors associated with greater knowledge.

Methods

Survey Distribution - The survey was distributed to newly matriculated first through third year residents in two pediatric, two EM, and four FM residency programs at Eastern Virginia Medical School and University of Texas Southwestern Medical Center at Dallas between June and August 2004. A majority of the surveys were completed in group settings with proctoring. This study was approved by institutional review boards at both institutions.

Survey Content - A 25-item survey was developed by the second author with consultation from national experts in child abuse pediatrics to ensure clarity and appropriate content. The survey assessed demographics, hours of didactic lectures related to child abuse received, number of patients with allegations of sexual abuse (SA) or physical abuse (PA) examined or observed, comfort with performing medical exams and investigation procedures, and knowledge related to the assessment and intervention of child abuse. “Didactic lectures” was defined to include class lectures, Grand Rounds, and clinical conferences. To facilitate interpretation, the initial response options for hours of didactic lectures received (none, 1-3, 4-6, 7-9, >9) and number of patients examined or observed (none, 1-3, 4-6, >6) were converted to dichotomous responses (less than 4 vs. 4 or more) based on a median split of the data.

Items assessing comfort were rated on a Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree) with higher numbers indicating greater comfort. Two summated scales were constructed from these items. The Medical Exam Comfort scale consists of four items that assess comfort with performing and interpreting medical exams for children suspected to have been sexually or physically abused. The Investigation Comfort scale consists of two items that assess residents’ comfort with interviewing a parent regarding suspected abuse and with speaking to law enforcement and child protective services regarding medical findings.

Items assessing knowledge were dichotomously coded as either correct or incorrect and formed the basis for three knowledge scales. The Clinical Knowledge scale consists of six clinical vignettes with multiple choice answers. Examples of two clinical knowledge questions are provided in the Appendix. The Anatomy Knowledge scale consists of three fill-in-the-blank items for which the respondent must identify three numbered anatomic structures from a color photograph of female genitalia (see Figure 1). The Overall Knowledge scale consists of all ten knowledge items (six clinical, three anatomy, and one interpretation question regarding Figure 1). Scores on the knowledge scales were calculated as the percent correct of all items in the scale for a score range of 0% to 100%.

Data Analysis - Categorical variables were described using frequencies and percentages, and group differences were compared using the $\chi^2$ statistic. The Holm’s sequential Bonferroni method was used to control for Type I error across all follow-up pairwise comparisons when a significant $\chi^2$ statistic was obtained. Mean differences in comfort and knowledge scores by site, specialty, year, and sex were compared by analysis of variance (ANOVA). Sex was included because it has been identified as a significant variable in previous studies on this subject (e.g., see Woolf, Taylor, Melnicoe et al.16). For all ANOVAs, a Specialty x Year interaction term was initially calculated but removed due to non-significance. Means reported for
these analyses are marginal means. Tukey’s HSD was used to test for significant pairwise differences between groups when a significant $F$ statistic was obtained. Partial correlations were examined using the Pearson statistic. Logistic regression was used to identify predictors of correct interpretation of the genital photograph. Alpha was set at .05. Statistical analyses were conducted using SPSS version 13.0.

Results

Sample - Of 274 surveys distributed, 187 (68%) were returned. This sample included surveys from 92 pediatric residents, 58 EM residents, and 37 FM residents. Demographic characteristics of the respondents by site and specialty are presented in Table 1. Overall, 58% percent were female and residents were roughly equally distributed across the three years. At Site B there were significantly fewer female residents in EM (29%) compared to pediatrics (68%), $\chi^2 = 14.0$, $p < .001$ and FM (73%), $\chi^2 = 8.7$, $p = .003$.

Child Abuse Training in Residency - Table 2 shows the percent of residents, by specialty and site, who reported receiving at least four hours of didactics in child abuse and examining or observing at least four patients with allegations of sexual or physical abuse.

At both sites, the proportion of residents who reported receiving at least four hours of didactics differed significantly by specialty, with the highest percent for pediatric residents. On the other hand, significant differences by specialty for patients examined and observed were seen only at Site A. In addition to the within-site differences noted in Table 2, significant differences were noted by site for FM residents. Compared to their FM colleagues at Site A, significantly more FM residents at Site B reported receiving at least four hours of didactics (40% vs. 9%), $\chi^2 = 5.0$, $p = .025$, seeing at least four SA patients (47% vs. 0%), $\chi^2 = 12.7$, $p < .001$, and seeing at least four PA patients (40% vs. 0%), $\chi^2 = 10.5$, $p = .001$ since residency began.

Comfort with Medical Exams and Investigation Procedures Related to Child Abuse - Table 3 shows mean comfort scores for the two comfort scales by site, specialty, and year.

Regarding comfort with performing and interpret-
ing medical exams on children with allegations of SA or PA, residents scored a mean total of 12.3 (SD = 3.1) out of a possible 20. Medical exam comfort differed significantly by site, specialty, and year but not sex. Comfort levels were significantly higher among Site A residents compared to Site B residents (p = .048). Follow-up tests showed that medical exam comfort was significantly higher among pediatric residents compared to family medicine residents (p = .011), and significantly higher among 3rd year (p < .001) and 2nd year (p < .018) residents compared to 1st year residents.

Regarding comfort with interviewing a parent regarding suspected abuse and speaking with law enforcement and child protective services regarding medical findings, residents scored a mean total of 6.4 (SD = 1.7) out of a possible 10. Investigation comfort differed significantly by year but not site, specialty, or sex. Compared to 1st year residents, comfort levels were significantly higher among 3rd year (p = .002) and 2nd year (p = .015) year residents.

A majority of residents disagreed or strongly disagreed that they were comfortable performing (47%) and interpreting (51%) sexual abuse exams, compared to only 14% and 36% who reported discomfort with performing and interpreting physical abuse exams, respectively.

Controlling for site and year, the number of sexually abused patients observed or examined was positively associated with comfort with managing the sexual abuse exam (r = .35, p < .001), and the number of physically abused patients observed or examined was positively associated with comfort with managing the physical abuse exam (r = .38, p < .001). Hours of didactics received was

| Table 3: Residents’ Mean Scores on Comfort with Medical Exams and Investigation Procedures Related to Child Abuse Cases, by Site, Specialty, and Year |
|---------------------------------------------------------------|
| **Medical Exam Comfort** | **Investigation Comfort** |
| **Factor** | **M (SD)** | **F** | **M (SD)** | **F** |
| Site | | | | |
| Site A | 12.7 (.35) | | 6.5 (.20) | |
| Site B | 11.8 (.35) | | 6.2 (.17) | |
| Specialty | | | | |
| Pediatrics | 12.9 (.33) | | 6.3 (.18) | |
| EM | 12.5 (.40) | | 6.6 (.22) | |
| FM | 11.4 (.50) | | 6.2 (.28) | |
| Year | | | | |
| 1st | 11.1 (.38) | 5.8 (.22) | 5.7** |
| 2nd | 12.4 (.40) | 6.6 (.22) | |
| 3rd | 13.3 (.39) | 6.8 (.22) | |

*Note. Ratings were given on a 5-point scale: 1 = Strongly Disagree to 5 = Strongly Agree.  
* Range is 4-20.  ** Range is 2-10.

Regarding comfort with interviewing a parent regarding suspected abuse and speaking with law enforcement and child protective services regarding medical findings, residents scored a mean total of 6.4 (SD = 1.7) out of a possible 10. Investigation comfort differed significantly by year but not site, specialty, or sex. Compared to 1st year residents, comfort levels were significantly higher among 3rd year (p = .002) and 2nd year (p = .015) year residents.

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not correlated with any exam comfort scale.

**Medical Knowledge of Child Abuse** - Residents averaged 68% (SD = 23.3) on clinical knowledge, 53% (SD = 30.2) on anatomy knowledge, and 63% (SD = 19.3) on overall knowledge. Table 4 shows scores for the three knowledge scales by site, specialty, year, and sex.

Clinical knowledge differed significantly by specialty and year but not site or sex. Compared to FM residents, clinical knowledge was significantly higher among EM (p < .001) and pediatric (p = .001) residents. Compared to 1st year residents, clinical knowledge was significantly higher among 2nd (p = .03) and 3rd year (p < .001) residents. Anatomy knowledge differed significantly by year but not site, specialty, or sex. Anatomy knowledge was significantly higher among 3rd year residents compared to 1st year residents (p = .01). Overall knowledge differed significantly by specialty, year, and sex but not site. Compared to FM residents, knowledge scores were significantly higher for pediatric (p < .001) and EM residents (p = .013). Compared to 1st year residents, knowledge scores were significantly higher for 3rd (p < .001) and 2nd (p = .005) year residents. Overall knowledge scores were significantly higher for females than males (p = .024).

In response to the color photograph of female genitalia (Figure 1), only 25 (13%) residents correctly identified all three anatomic structures. The percent of residents correctly identifying the urethra, labia minora, and hymen were 68% (n = 127), 24% (n = 45), and 65% (n = 121), respectively. A majority of the residents (59%, n = 110) correctly concluded from the photograph that there was “no evidence of trauma, but that sexual abuse cannot be ruled out.” Seventy-six (41%) residents misinterpreted the photograph, including 53 (29%) who concluded incorrectly that this normal genital exam was “definitely abnormal,” possibly (26%) or definitely (3%) due to sexual abuse. In a logistic regression model, correct identification of the anatomic structures was a significant predictor of correctly interpreting the photograph (OR = 1.60, p = .007).

Clinical and Overall knowledge was positively correlated with hours of didactics in CA (Clinical: r = .15, p = .04; Overall: r = .20, p = .007; controlling for site and year); the number of physical abuse patients seen (Clinical: r = .24, p = .001; Overall: r = .27, p < .001; controlling for site and hours of didactics); and the number of sexual abuse patients seen (Clinical: r = .34, p < .001; Overall: r = .34, p < .001; controlling for site and hours of didactics).

**Discussion**

To our knowledge, this is the first study to compare child abuse residency training, comfort, and knowledge among the three medical specialties (pediatrics, EM, and FM) most likely to first encounter abused children. Previous studies of child abuse knowledge and training among various residency specialties have included pediatric and FM samples, but EM residents have been largely excluded from this line of research. The omission of EM residents is noteworthy given the acute nature of many forms of abuse and the likelihood that medical intervention is sought first in the emergency department. The measure used in this study to assess resident knowledge of child abuse utilized clinical vignettes and included items which assess both physical and sexual abuse, important features missing in previous studies.

**Training** - In this study, pediatric residents at both sites reported receiving the most hours of didactics in child abuse during residency compared to EM and FM residents. Other studies also have reported higher levels of didactic child maltreatment training among pediatric residents compared to residents from other specialties. Such findings are consistent with the child-centered focus of the pediatric specialty. FM residents at the two sites differed significantly, with 40% of FM residents at Site B reporting at least four hours of instruction compared to only 9% at Site A. FM residents at Site B also saw substantially more SA (47% vs. 0%) and PA (40% vs. 0%) patients during their training compared to FM residents at Site A. Reasons for these dramatic differences are not clear, and discussions with FM program directors at both sites did not provide any clues. Nonetheless, it represents an important observation and preliminary evidence that training can vary widely from program to program, even within the same specialty. Presently, the amount of residency training in the area of child maltreatment considered optimal for each specialty has not been established, and there is no national accrediting or licensing body that regulates residency programs’ curricula on this topic. In addition, the lack of nationally representative data on residency training characteristics precludes the identification of an optimal or even baseline level of child abuse training for which programs across the United States should strive. This is a relevant educational and training issue for all specialties. Medical professionals, regardless of specialty, will encounter cases of abuse and neglect during their careers, and every state in the U.S. considers them mandated reporters. Although it is expected that training breadth and depth should and will vary
among specialties, there is no reason to see such wide variation in training within specialties. If an optimal or even standard level of training can be established for each specialty, such a benchmark would serve as an important tool for program directors and others in developing and evaluating their own child abuse training. At present, the field lacks even the baseline data against which residents’ progress could be measured at a national level. Ultimately, residents should receive enough training to equip them with the knowledge and skills necessary to identify and report abuse when it is suspected, and the prior literature suggests that the current levels of training are not meeting this critical goal.

Comfort - The more abuse patients a resident saw, the more he or she was likely to report being comfortable with handling SA and PA exams. Ward (2004) also found a relationship between number of abuse cases seen and the perceived competency “in the evaluation and management of child abuse cases” of a sample of pediatric residents in Canada.22 On the other hand, there was no discernable relationship between hours of didactics received and any of the comfort scales. These relationships provide some support for the unique contribution clinical experience can provide over more formal, didactic methods. Currently, there is no requirement that programs require or even offer rotations in child abuse. As a result, it is only by chance that many residents will see a child with allegations of abuse prior to beginning their post-residency career. Few would argue that didactics alone can provide the kind of meaningful educational experience that is afforded to residents in the clinical setting. Child abuse training provided to residents should include sufficient clinical exposure to the kinds of patients they will likely encounter after they graduate. Programs should make every effort to collaborate with local child abuse specialists or advocacy centers to provide residents with appropriate learning opportunities. When no local programs exist, ED faculty should devise methods to allow residents maximum exposure to potentially abused patients.

Lastly, residents reported significantly more comfort handling physical abuse exams compared with sexual abuse exams, a pattern also seen in research with medical professionals with more advanced training, including pediatric emergency medicine fellows23 and practicing pediatricians.15 Although this difference is likely explained by the inherent sensitivity surrounding sexual topics, other possible factors might include inadequate knowledge of genital anatomy and exam techniques. Regardless of the reason, discomfort among medical professionals is not a trivial issue. In one study, four out of six groups of physicians interviewed reported that discomfort with sexual topics was a significant barrier to inquiring about suspected abuse.13 When evaluating their programs’ child maltreatment training, program directors should consider including questions about comfort, in addition to the traditional indicators used to measure residents’ progress (e.g., knowledge of guidelines and practice). A knowledgeable but uncomfortable resident may provide substandard care.

Knowledge - On both clinical and overall knowledge, FM residents performed significantly worse than pediatric and EM residents. This finding conflicts with a previous study by Woolf (1988) who found “no appreciable differences” in knowledge scores between pediatric and FM residents.16 At both sites, FM residents had the lowest clinical and overall knowledge scores. One possible explanation for this is that FM residents, with their broad general areas of training, may not be exposed to sufficient specialty training in areas such as child abuse.

Our finding that clinical and overall knowledge correlated highly with hours of didactics (also seen in Woolf’s study) and number of patients seen during residency lends support to the complementary value of combining formal didactics with clinical training. However, neither of these complementary approaches was correlated with anatomy knowledge, which was low among all three specialties. Only 13% of our residents correctly identified all three anatomic structures, and 41% misinterpreted the exam as abnormal. Concern regarding the lack of knowledge regarding female genitalia among medical professionals is not new.10, 24 In Lentsch and Johnson’s (2000) survey of 370 primary care physicians, 73% of physicians correctly identified the urethra (vs. 68% of our residents), 83% the labia minora (vs. 24%), and 62% the hymen (vs. 65%) from a black and white photograph of a normal female genitalia. Although the majority of the physicians in Lentsch and Johnson’s study correctly labeled these structures, 62% of them still interpreted a normal exam as abnormal. There is also evidence to suggest that the problems identified by this and other studies exist in the real clinical setting. Makoroff and colleagues (2002) found that 70% of the female genital exams diagnosed by pediatric emergency medicine physicians as abnormal were diagnosed normal by child abuse-trained physicians who reexamined the findings. Based on physicians’ discomfort with sexual abuse and limited knowledge of female genitalia seen in this and other studies, improving the training related to the medical management of sexual abuse should become a priority. Basic anatomy courses during medical school may be the optimum time and place to emphasize accurate identification of basic features of female genitalia. The diagnosis and management of sexual abuse presents significant challenges to medical professionals, and studies repeatedly show that many
physicians feel unprepared to effectively handle these cases.

Improving Child Abuse Residency Training with a Standardized Curriculum - Despite the increased role of physicians in the identification of child maltreatment over the past 20 years, many residents remain uncomfortable and ill-equipped to effectively manage cases of child abuse. Residency is the optimal time for training in child abuse, but concerns regarding the adequacy of this training have been expressed by both physicians and residency program directors. Wide-scale improvements in medical education in this area have not occurred, due in part to the specialized nature of child maltreatment and not helped by the absence of a standardized curriculum which programs could easily incorporate. Physician specialists in child abuse have increased in number over the years, but their availability as consultants remains limited primarily to academic centers. As a result, the quality and quantity of training in child maltreatment varies widely from program to program. A national need for the implementation and standardization of residency curricula related to child maltreatment has emerged. A model curriculum for medical fellowships in child abuse and neglect and core content guidelines for residency have been published. Standardization would ensure that all residents achieve basic competencies related to the evaluation of child maltreatment. An established curriculum could be supplemented with modules designed to provide additional information tailored to various specialties. The curriculum and modules should be developed with expert consensus and guided by the research findings from this and other similar studies. Efforts are underway to expand this study on a national level to systematically examine the content, effectiveness, and trends in residency training throughout the United States. Until that time, however, incremental improvements in residency training curricula can have a significant impact on residents’ preparation for managing cases of child abuse. Additional hours of instruction, more exposure to patients with alleged abuse, and elective or required rotations with child abuse specialists, are all simple but effective ways to increase competency in the field.

Limitations - This study had several limitations. Due to the funding timeframe which supported this study, surveys were administered during summer when residents were just starting their training. This survey timeframe may have resulted in lower assessments of knowledge than is true for the total resident population. Although our knowledge survey had several advantages over measures used in previous research on this topic, a 10-item questionnaire to measure what is inherently a heterogeneous construct represents only a first step. Future research with larger samples can incorporate the latest techniques in test development to develop measures which best assess the kind of knowledge physicians should gain during residency. Finally, measurement of the amount of training residents received was based on self-report. Future studies which assess residency training by self-report can be strengthened by surveying the corresponding residency program directors.

Conclusion

This study of residents from three specialties revealed deficits in the training, comfort, and knowledge related to the medical assessment of child abuse. Differences in training and knowledge were seen both across and within specialties from two separate institutions. Pediatric residents reported receiving significantly more hours of didactics in child abuse than EM and FM residents. FM residents demonstrated the lowest levels of clinical and overall knowledge. All specialties demonstrated poor identification of genital anatomy, with 87% of all residents unable to correctly identify three basic anatomic structures from a color photograph of female genitalia. Knowledge of anatomy was a significant predictor of ability to interpret a genital exam. Hours of didactics in child abuse and number of patients seen during residency were positively correlated with knowledge. This and other studies support the need for greater improvements in residency training, particularly in the area of managing sexual abuse. The development and implementation of a standardized curriculum may remedy many of the deficits in residency training in knowledge identified in this and previous studies.

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Appendix

Sample knowledge questions

1) You are moonlighting at a rural ED where you are the only physician who provides medical services for sexually abused children. A 6 year old presents with her mother who recounts an episode of alleged sexual abuse occurring two weeks prior. You are the first person to whom the mother has disclosed. What needs to be done?
   (a) report to CPS
   (b) perform a complete examination
   (c) collect a forensic evidentiary kit
   (d) all of the above
   (e) a and b only *

2) A parent reports a history that her 4 month old child had an unwitnessed fall off the bed onto a hardwood floor. What injury would you NOT expect to find?
   (a) bruise on forehead
   (b) abrasion on scalp
   (c) linear skull fracture
   (d) complex skull fracture *
   (e) subgaleal hematoma

* Correct answer