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Emergency medical services provider perspectives on pediatric calls: A qualitative study

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ABSTRACT

Objective: Previous research indicates that 9-1-1 response to incidents involving children is particularly distressing for emergency medical services (EMS) clinicians. This qualitative study was conducted to increase understanding about the difficulties of responding to pediatric calls and to obtain information about how organizations can better support EMS providers in managing potentially difficult calls.

Methods: Paramedics and emergency medical technicians from a single US ambulance service were invited to participate in focus groups about responding to 9-1-1 calls involving pediatric patients. A total of 17 providers from both rural and metro service regions participated in six focus groups held in community meeting spaces. A semi-structured focus group guide was used to explore (1) elements that make pediatric calls difficult, (2) pre-arrival preparation practices, (3) experiences with coping after difficult pediatric calls, and (4) perspectives about offered and desired resources or support. Focus groups were audio recorded and transcripts were analyzed using standard coding, memoing, and content analysis methods in qualitative analysis software (NVivo).

Results: Responses about elements that make pediatric calls difficult were organized into the following themes: (1) special social value of children, (2) clinical difficulties with pediatric patients, (3) added acuity to already challenging calls, (4) caregivers as secondary patient, and (5) identifying with patient or patient's family. Pre-arrival preparation methods included mental or verbal review of hypothetical scenarios and refocusing nerves or emotions back to the

technical aspect of the job. Participants described using available resources that largely took the form of social support. Suggestions for additional resources included: increased opportunities for external feedback; more frequent pediatric clinical training; institutionalization of recovery time after difficult calls; and improved storage and labeling of pediatric equipment.

Conclusions: This study provides qualitative data about the difficulties of responding to pediatric calls and resources needed to support clinicians. Findings from this study can be used to guide EMS leaders in designing and implementing institutional initiatives to enhance training and support for prehospital clinicians providing care to children.

INTRODUCTION

Emergency medical services (EMS) providers experience pediatric calls infrequently, with recent studies indicating that children make up 10% or less of all EMS encounters, and comprise just 5-7% of all EMS transports.[1-5] Despite lower utilization, children transported to the hospital by EMS are typically more acutely ill and more frequently require care within 15 minutes of emergency department (ED) arrival than those who are brought to the ED by other means.[1]

Calls involving children are often among the most disturbing incidents for responders,[6-10] and EMS workers who regularly experience critical incidents and exposure to traumatic events are susceptible to sleep disorders, anxiety, and PTSD.[6,11-13] Literature on EMS professionals' perceptions of stress and anxiety related to treating pediatric patients has largely focused on implications for patient safety[14-19] or on whether training and education affords the same benefit to increasing provider comfort with caring for children as on-the-job experience.[20-22] Qualitative studies of EMS perspectives on pediatric care in the United States with a focus on provider needs and wellbeing are lacking.

We conducted a qualitative analysis of EMS clinician responses provided during semi-structured focus groups in order to investigate elements that make pediatric calls particularly difficult, methods of preparation for pediatric calls, and coping practices commonly employed after encounters with pediatric patients and their caregivers. Additionally, we queried participants about what resources might help providers feel better prepared and supported when pediatric calls occur.

METHODS

Setting and Participants

This focus group study was conducted at Allina Health EMS, a large ambulance service that provides 9-1-1 dispatch, advanced life support, basic life support and scheduled medical transport in approximately 100 communities in and around Minneapolis-St. Paul, Minnesota. The agency employs paramedics, emergency medical technicians (EMT), dispatchers, and support staff, and responds to just over 110,000 calls annually across a service area that covers 1800 square miles. Paramedics and EMTs were recruited for the study through invitations circulated via weekly staff emails, flyers posted at ambulance bases, the agency's social media page, and emails from the EMS chaplain. Interested participants were instructed to contact a single study investigator (MF) by phone or email. After confirming eligibility with a brief screening, they received information about the dates and times of focus group sessions which were conducted at off-site community meeting spaces. To decrease the potential for inhibited responses related to reporting structure, supervisors, managers, and field training officers were not eligible to participate in the study. Probationary employees who had been providing 9-1-1 response for less than one year were also excluded due to the potential lack of sufficient experience with pediatric patients. Participants were asked to wear street clothes to the focus groups in an attempt to diminish the ability of others in the group to identify individuals and their role with the agency (e.g. paramedic, EMT). A $50 gift card was offered to focus group participants in appreciation for their participation.

Focus Groups

At the beginning of each focus group session, research team members and participants introduced themselves and completed informed consent procedures. Each participant filled out a short demographic survey and an audio recorder was started to capture the discussion. A single research team member (MF) with extensive qualitative research experience facilitated all focus group sessions to ensure all topic areas were raised and that probing for details and clarification was consistent. The facilitator used a semi-structured discussion guide developed by the investigators (**Supplemental File)** that included questions and probes about four main areas: (1) elements that make pediatric calls difficult, (2) pre-arrival preparation practices, (3) experiences with coping after difficult pediatric calls, and (4) perspectives about offered and desired resources or support. A second research team member (JJ) with previous experience with focus group research and key informant interviews was present to take notes. At the end of the discussion, a summary of major themes was read back to participants who were then invited to correct, amend and confirm the summary. Members of the research team met to debrief and identify early themes from the focus group sessions.[23]

Data Analysis

Audio recordings of the focus groups were transcribed verbatim by a contracted external party (Tybee Types; Savannah, Georgia) and uploaded into NVivo 10 software (QSR International Pty Ltd; Doncaster, Victoria, Australia)[24] for analysis. Transcripts were analyzed using a directed content analysis approach, which is often used when research or theory about a specific topic is limited.[25] The initial step involved compiling themes from the discussion summaries that were presented to participants at the end of each focus group. The investigators then assembled summary statements for each of the four areas of inquiry, identified subthemes, and defined

subtheme nodes. Two of the investigators (JJ and LB) with experience coding qualitative data then independently coded 20% of the transcripts, compared results and refined node definitions to further clarify the coding framework. A single researcher (JJ) coded the remaining data through an iterative reading and rereading of the transcripts and assigned quotes to nodes. The research team reviewed the content within each node and findings were validated through group consensus.

Human Subjects Protection

This study was approved by the Allina Health Institutional Review Board and all participants provided written informed consent before participating in the discussions. During the informed consent process, participants were provided with a list of resources that could be accessed in the event that the discussions prompted negative emotions, intrusive memories, etc. Participants were asked to refrain from using any private health information when sharing stories about specific calls and were reminded to maintain the confidentiality of fellow participants following the focus groups.

RESULTS

Thematic saturation was achieved after transcript analysis of six focus group sessions with 17 EMS provider participants. Minimum attendance at the sessions was 2 participants and the maximum attendance was 5 participants. The median duration of the focus groups was 89.5 minutes with a minimum duration of 60 minutes and a maximum duration of 102 minutes. Participant demographic details are presented in **Table 1**. Themes within each of the 4 topic areas studied are summarized below, with illustrative quotes shown in **Table 2**.

Elements that Make Pediatric Calls Difficult

Special social value of children

Pediatric patients were described as fundamentally different from that of adults or even teenagers largely due to the idea that children have a special social value. Children are considered innocent and their injuries or death often feel preventable. Participants also noted that the greater potential years of life lost with children contributes to a sense of higher stakes and stress for those providing care.

Clinical difficulties with pediatric patients

Participants described pediatric encounters as low frequency calls with high potential for clinical risk. Specialized dosages and smaller equipment often increase clinical difficulty. Providers noted that it can be challenging to assess pediatric patients who may have minimal verbal ability, e.g. whether a crying response is due to pain, fear or stress. Some participants described generally feeling uncomfortable or unfamiliar with communicating with children.

Added acuity to already challenging calls

For call types already considered to be challenging for EMS providers, participants described an amplified acuity when the patient is a child. Examples of these types of calls included psychiatric cases, abuse situations, and medically complex patients with high-tech equipment needs such as a ventilator or tracheostomy tube.

Parents as secondary patient to manage

Clinicians noted that while they are often reliant on the parents/caregivers of a pediatric patient as a source of medical history and as a comfort or communicator for the child, they can sometimes be an added source of stress or a burden on the scene. For example, it can be challenging for EMS personnel to remain focused on the clinical needs of the child when parents/caregivers on scene are requiring reassurance, demanding answers, or questioning clinical decision-making. In extreme cases, such as abuse calls, it can be difficult for providers when they perceive the parent/caregiver as directly responsible for the child's medical emergency.

Identifying with patient or patient's family

Pediatric situations with direct similarities to a provider's life were highlighted as difficult to cope with emotionally. Participants commented that it is not unusual to experience the transference of their feelings and emotions for young patient to a child in their own life, and this has the potential to produce mental trauma.

How Providers Prepare for Pediatric Calls

Review of scenarios

Participants described that they often mentally or verbally review possible scenarios while en route to a pediatric encounter. This included revisiting care protocols, calculating pediatric drug dosages, and locating pediatric or other specialized equipment. It also included reviewing past calls, discussing hypothetical situations, and quizzing with their crew partner.

Reframing

When prompted to describe how they prepare emotionally for pediatric calls, some providers described taking a deep breath to slow their heart rate or clear their head. Participants cited the perceived importance of refocusing any emotions related to the call back towards the technical or medical aspects of the job.

How providers cope with difficult calls

Sharing with others

Many participants shared that they find great value in talking through calls after they occur, particularly reviewing the clinical aspects of a call that was perceived to have had a poor outcome. Specifically, they mentioned discussing what they did right and what could have gone better with trusted EMS partners or peers. Friends and family were also common sources of emotional support after experiencing difficult pediatric calls.

Engaging in activities away from work

Many mentioned engaging in activities after returning from a difficult day or call. These activities could be social, such as going to church or playing with children, or solo activities such as playing video games or going to the gym. Eating and drinking alcohol were also mentioned as common coping mechanisms used by participants and their EMS peers.

Using sarcasm or humor

Participants discussed using sarcasm and dark or gallows humor in response to difficult encounters with children, and noted that these are largely viewed by EMS professionals as acceptable mechanisms for processing emotions.

Work-life balance

Many clinicians emphasized the importance of creating a separation between their families and their EMS work to prevent work-related stress from impacting other areas of their lives. These individuals talked about their reticence to discuss calls at home, and their desire to reserve specific time to engage with non-EMS family and friends. However, others described the opposite arrangement where taking extra shifts or working multiple EMS jobs sometimes helps them to cope with or escape home stressors.

Resources and Support for Clinicians

Resources and support currently utilized

Participants reported primarily turning to social supports after difficult pediatric calls. This includes support from EMS peers and colleagues, although this was described as contingent on having a close relationship or rapport with the other party. Though not all participants utilize the agency's EMS chaplain[26] regularly, participants seemed to be aware of the availability of the chaplain and he was described as a helpful resource by those who had elected to consult him for support. Critical Incident Stress Debriefings (CISDs)[27] were given mixed reviews. Some participants discussed the value of CISDs as opportunities for feedback and building community, while others described them as unhelpful or even stressful to attend.

Desired resources and support

In addition to what is currently available, participants expressed a variety of ideas for enhanced clinical or professional support. In terms of clinical support, many stated they would welcome more pediatric training and suggested that annual pediatric trainings should be mandatory as opposed to optional. Participants also suggested some strategies for labeling and storage of pediatric-specific devices and equipment on ambulances to make them more readily identifiable and accessible. Some mentioned streamlining access to automatic calculators for dosage conversions and computations. Professional supports desired by participants included better follow-up after critical incidents by hospital staff and EMS managers, and the ability to remove a truck from service (i.e. "take a time out") after distressing calls. Participants emphasized that they believe EMS providers are less likely to utilize resources and support, both current and future, without clear mandates, prompts, or endorsement from a supervisor.

DISCUSSION

Participants' characterizations of elements that make pediatric calls difficult were consistent with findings from other studies that examined safety and medical error issues in the prehospital care of children which found that the inherent vulnerability and value of children is a key source of stress and anxiety for EMS providers.[15-17] Smaller dosages are known to be difficult to calculate, contributing to increased potential for errors[16,18,28] and an overall unfamiliarity with caring for children is logical given the relative infrequency of pediatric EMS calls. Other studies have found that parents and presence of family can greatly increase the stress of caring for a pediatric

patient [15,17] and that it is not uncommon for providers to encounter pediatric patients who have experienced suspected abuse or neglect.[29] There is much literature documenting the added emotional challenge from identifying with the child or family on scene.[6,8,15,17,30,31]

This study found that EMS providers are very comfortable preparing for the technical aspects of a pediatric call once alerted to the emergency. Participants discussed reviewing care protocols or dosage calculations and they also routinely discussed going over past calls with their partners and peers as both a preparation tool and coping mechanism. However, when participants ventured into discussion about mental or emotional preparation it was only after being prompted that they often described reframing or refocusing their feelings towards the technical aspects of the call. Reframing or positive reinterpretation as a cognitive strategy has been documented in other cohorts of EMS workers[11,32], but a study by Regehr et al. suggests that while it can be protective during the critical incident, the practice can have long-term negative consequences such as emotional distancing from social supports and even substance abuse.[31] While pre-arrival preparation with a focus on the medical and technical aspects of rescue work may have a positive impact on clinical readiness, self-protection strategies that optimize EMS provider wellbeing and mental health require further exploration.

Calls for more pediatric training were common in our focus group sessions. This study does not address the efficacy of pediatric training, but does confirm that providers are open to attending pediatric training opportunities as a way to become more comfortable caring for children. In two recent studies, paramedics reported that the standard pediatric training offered during paramedic education programs is inadequate and that additional training is important given the infrequency

of pediatric encounters.[18,33] The Emergency Medical Services for Children performance measures indeed endorses increasing the frequency of educational opportunities for developing pediatric skill competencies in its EMSC 03 Performance Measure: Use of pediatric-specific equipment.[34] In accordance with our findings, others have documented that EMS providers generally support the need for mandatory pediatric continuing education and training, including simulation, to develop clinical proficiency[21,22,35] and communication skills[36].

During the discussions about what might help providers feel better prepared and supported when difficult calls occur, there was a pervasive sentiment among participants that EMS culture is a barrier to resource utilization after difficult pediatric calls. A 2008 survey of ambulance personnel found that this occupational group is less likely to seek help than the general working population.[37] Other studies have noted that there is a perception among EMS workers that management does not adequately care for the wellbeing of providers and that support for workers is inadequate.[6,31,38,39] While the larger topic of EMS culture and its impact on resource utilization is beyond the scope of this study, the feedback gathered as part of this study highlights the important role culture may play in successful coping and recovery after difficult encounters with pediatric patients.

LIMITATIONS

Focus groups are inherently limited by geography, small sample size, and participant self-selection, all of which limit the generalizability of our results to the larger population of EMS providers. While this study excluded employees who had been providing 9-1-1 response for less than one year, nearly a third (29%) of the participants indicated they had 0-5 years of experience,

further limiting the representativeness of the sample and comparability of findings to groups of more experienced providers. The inability to recruit a critical mass of providers who respond specifically in rural service areas also hinders the representativeness of the study. Because of the broad geographic area covered by the agency, the original intent was to conduct some focus group sessions specifically with rural area providers to identify any unique differences across practice settings, but participation by rural area providers was too low to achieve this. A single coder conducted 80% of the coding, raising the potential for researcher bias as well as less reliability and trustworthiness in the analysis than if the two coders had coded all transcripts independently. Finally, the discussion guide probes may have led participants to speak about some topics more than they would have unprompted.

CONCLUSION

EMS professionals are called to critical incidents involving children infrequently, but it is widely acknowledged by emergency responders that pediatric encounters are often the source of much anxiety and stress. Few studies however, have moved beyond anecdote to examine and articulate exactly why these calls represent a unique challenge to emergency responders, and to understand responders' perceptions about support. This study provides key insights about the difficulties of responding to pediatric calls and about the resources that may be needed to adequately support EMS clinicians. Findings from this study can be used to guide EMS leaders in designing and implementing institutional initiatives to enhance training and support for prehospital clinicians providing care to children.

DISCLOSURE OF INTEREST

The authors report no conflicts of interest.

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Table 1. Focus group participant characteristics

	Frequency	
Variable	Number	Percentage
Age (yrs)		
18-24	2	12%
25-34	8	47%
35-44	2	12%
45-54	2	12%
55+	3	18%
Sex		
Male	9	53%
Female	8	47%
Tenure with current EMS agency (yrs)		
0-5	10	59%
6-10	4	24%
11-15	0	0%
16-20	0	0%
21+	3	18%
Tenure in EMS (yrs)		
0-5	5	29%
6-10	5	29%
11-15	4	24%
16-20	0	0%
21+	3	18%

Response Setting		
Metro	15	88%
Non-metro/rural	2	12%

Table 2. Participant quotes to support thematic analysis

Thematic analysis	Exemplary quotes
Theme 1: Elements that Make Pediatric Calls Difficult	
Subtheme: Special social value of children	1. "Part of it is they're at the start of their life and now that life is gone or that life is severely changed, versus somebody who's elderly where they've had the vast majority of their life..." 2. "The big change from peds calls to adult calls is that everybody seems to care the most about children, because of that innocence factor that they have, because of the fact that they can't save themselves." 3. "Kids are innocent, and that makes it a lot harder to deal with."
Subtheme: Clinical difficulties with pediatric patients	1. "Children are weight-based dosages, and that can be really stressful for us…it's just such a low percentage of calls, and when we get them, we're – I wouldn't say not prepared, but we're more nervous, most definitely." 2. "Their anatomy is so small. Their tongue is disproportionately bigger compared to an adult, so trying to get an intubation in, I don't ever want to have to touch it." 3. "It's very difficult to assess those patients on the call, because with an adult you can get the, 'Oh, yeah, that's making me feel better; oh, no, that hurts more.' With a kid you don't really get that. They're just crying and screaming the whole time…"
Subtheme: Added acuity to already challenging calls	1. "Because psych calls, you shouldn't have flashbacks of them or wonder how is that little one doing. It should be take him to the hospital and drop him off. But no, it's written in your head now, on your mind. There are some that just stay on your heart. Those are the hard ones." 2. "I've had a lot of super sick kids, like kids that are chronically sick, on trachs and vents, that kind of situation…It just makes it more intense and even though whatever problem it is, is normally super easy to fix." 3. "…high-tech adult patients are stressful for many because it's not something that we trained on, not nearly enough, so then you put a pediatric high-tech, like a high-tech kid, and that's even worse."
Subtheme: Parents as secondary patient to manage	1. "Well, a lot of parents are very anxious or upset; they want you to fix what's wrong, and what they deem to be wrong, and you need to be able to do that while calming them – essentially two patients at that time." 2. "…you don't just have the one patient; you have two patients, usually. You have parents to deal with, you're trying to help and save, or take care of their kid, but you also have to keep the parent calm." 3. "I think, too, the hard part with pediatric calls, there are parents

	involved that are freaking out, so as you're trying to take care of that child, you also have to be concerned about that parent caregiver too"
Subtheme: Identifying with patient or patient's family	1. "All I could think about was how my daughter, five years old, her world is filled with exploring and adventure and Barney, everything that's good and fun and friendly and all that, and the living hell that this other five-year-old girl had apparently gone through cost her her life." 2. "Because every provider is going to do everything they can, but when you make that emotional connection, that's when it gets really difficult." 3. "…it's even harder for the medics who, if they have babies of their own or children around that age."
Theme 2: How providers prepare for pediatric calls	
Subtheme: Review of scenarios	1. "I've thought it's sometimes helpful to sort of go through the 'what if' questions in your head. Like, 'this might be super unlikely, but what if this? What if that?'" 2. "Sometimes you're going through in your head, depending on what the call scenario is, what types of things you're going to need because you have to bring different equipment or have different – the protocols are different…" 3. "I always carry a piece of paper in my pocket. I pull it out, I do the drug math so I don't have to think about it during the call; I can just refer to my charts."
Subtheme: Reframing	1. "I think the more clinically prepared you are keeps you emotionally prepared to a point, because you feel that you are up to speed and you feel that you can do whatever you can." 2. "I'm really going to try to be as prepared as I can be, and then deal with the emotional part afterwards."
Theme 3: How providers cope with difficult calls	
Subtheme: Sharing with others	1. "If you trust your partner to talk to them, that they're not going to take it everywhere and talk about it to everybody else, you can talk about it between yourselves." 2. "I'll call [my spouse] right away after something bad happens, because he's the first voice I want to hear, but he still doesn't understand what it was I just went through. If I can analyze and talk and discuss with my partner, that's ideal…"
Subtheme: Engaging in activities away from work	1. "Whatever you do to decompress, whether it's working out, whether it's fishing or hunting…" 2. "I'm very active with the Bible group that I go to and keep my faith strong, that relationship. I've got my creative outlets; I like to do sewing and quilting and knitting and crocheting."
Subtheme: Using sarcasm or humor	1. "We're dark humored because it's the only way we know how to cope with it." 2. "I think that humor is where some of that [tough front] comes in. It's…sarcasm."
Subtheme: Work-life balance	1. "A lot of us work at multiple places, so for me, I try to make sure I have one day a week where I'm not doing anything EMS, nothing at all." 2. "I don't think about it when I'm home, I don't run through calls at

	home; it's all at work; I don't bring it home." 3. "…we do so much overtime, or because we've got three jobs, or because we feel the need to make more money, or we feel the need to keep doing what we do, we never have three full days off in a row. If we do have three days off in a row…we go back in to do work"
Theme 4: Resources and Support for Clinicians	
Subtheme: Resources and support currently utilized	1. "For me it's just always been that partner, because they're right there with you and they'll know what's going on, and you really want somebody that can understand what's happening." 2. "Usually, when I hear other people talking about, if you do hear somebody talking about a call, I'm usually all ears. I want to hear what happened. What was the call, what you did, what the outcome was. I think there is some benefit from learning from others by listening to what they went through." 3. "I've used our chaplain a couple of times. He's not super-religious, which is really cool…he's just there as an emotional support. 4. "I think people support us if we go to CISD, like the stress debriefs with the cops and fire fighters and stuff. I've been to them; I really enjoy them. That's really the biggest resource that I've used, and I think that we're 100% supported if we choose to go to those."
Subtheme: Desired resources and support	1. "I would love to have our pediatric bag back so I don't have to sit there and wonder if I'm missing this or where's that." 2."…we're just left unknowing if we did a good job, a great job or a horrible job. Not that I want to be told I did a horrible job, but I want to know if there's something I missed." - Session 2, Participant 4 3. "I almost feel, too, on one hand it would be nice if management would seek us out when they know that that [critical incident] call just went on." 4. "If you went code 3 into a hospital pediatric call, I feel like you should at least be given 30 minutes…Just give me 30 minutes, a time out."