

Unmet mental health needs in pediatric epilepsy: Insights from providers

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Abstract

Eighteen pediatric neurologists and 18 pediatricians completed a 5-point Likert scale questionnaire on their knowledge of, attitudes toward, and management of the behavioral, cognitive, and psychosocial aspects of pediatric epilepsy, before and after a lecture on this topic. They also responded to questions about possible barriers to mental health care of children with epilepsy. The brief educational intervention modified the knowledge/attitudes of pediatricians compared with pediatric neurologists on the impact of epilepsy on behavior and cognition in children with epilepsy. However, there were no between-group differences in how providers perceived their competence to assess behavioral and cognitive comorbid conditions in pediatric epilepsy. Responses to open-ended questions suggested insufficient mental health coverage for and expertise on pediatric epilepsy, resistance of mental health clinicians to treat children with epilepsy, and the stigma of mental health as possible barriers to mental health care in children with epilepsy. In addition to the need for provider education about the behavioral and cognitive comorbid conditions of pediatric epilepsy, these findings emphasize the importance of examining alternative routes to increasing mental health care for children with epilepsy.

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1. Introduction

Although epilepsy is a common neurological condition in childhood [1], physicians have limited knowledge about and familiarity with this disorder [2–5]. More specifically, a quarter of 50 general practitioners had not witnessed a seizure by the time they qualified to practice medicine. Two-thirds felt they gained most of their knowledge about epilepsy from informal readings after their qualification [6].

In addition to knowledge about the neurological aspects of epilepsy, physicians should also be aware of the high rate of psychopathology [7–16] and unmet mental health needs in this population [8,9,17–20]. However, many primary care physicians report they lack expertise or have been given inadequate training to assess children's emotions and behavior [6,21]. Their unfamiliarity with newer antiepileptic drugs (AEDs) [5] and the effects of AEDs on cognition and behavior may represent an additional barrier to these behavioral assessments.

Interestingly, and as found in pediatric chronic illness [22–24], there is also little concordance between the perceptions of physicians and parents on the global, medical, and mundane impact of epilepsy on children's lives [25,26]. Thus, parents worry about how epilepsy affects children's

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behavior and learning, whereas pediatric neurologists believe parents are concerned mainly about seizure control and stigma [25,26]. These differences in perception between physicians and parents, together with physicians' lack of knowledge of the impact of epilepsy on behavior [27], could underlie infrequent mental health care referral of these children.

Furthermore, as found in the general population of children with behavioral and emotional problems [28–31], most parents of children with epilepsy lack knowledge on the mental health needs of their children or might be reticent to access such care [7,32]. Still, they need to be quite assertive to obtain this care for their children, as demonstrated in studies on children with chronic illness [33,34]. In fact, even when parents make such requests, physicians agree to make these mental health referrals or record parents' requests for such referrals only if the child has severe behavior problems, the parent has psychological problems, the child reports a problem directly to the physician [35], or both parents and physicians agree that the child has behavior problems [36].

Yet, children in the general population are also often reluctant to seek mental health care if it is not physician or parent initiated [37]. This might reflect the stigma associated with mental health care [38] and the social stigma related to epilepsy [7,39–41]. However, youth may also not recognize the nature of their internalizing or externalizing problems [42]. In addition, ethnic and cultural barriers may also add to the reluctance of these children and their parents to access mental health care [20,43–45].

The findings of the previously reviewed studies emphasize the importance of examining what physicians know about behavioral and cognitive comorbid conditions in pediatric epilepsy, their attitudes toward the need for mental health services in these children, and how they assess and manage the need for mental health services in their patients with epilepsy. However, there is little research in this area. Identifying providers' knowledge of and attitudes toward behavioral and cognitive comorbid conditions in pediatric epilepsy and gaining a better understanding of possible barriers to mental health care may provide insights into how to improve mental health care for these children.

Therefore, in this study, we compared knowledge of and attitudes toward the behavioral and cognitive comorbid conditions of epilepsy, as well as management practices regarding mental health assessment and referrals in two provider groups: pediatricians and pediatric neurologists. In addition, we explored what providers perceive as barriers to mental health care and if they are aware of cultural differences regarding the stigma of mental health referrals in children with epilepsy and their parents. After a brief educational intervention in the form of a lecture on the behavioral and cognitive comorbid conditions as well as psychosocial aspects of pediatric epilepsy, we determined changes in physicians' knowledge of, attitudes toward, and management practices regarding the mental health needs of these children.

We hypothesized that, both before and after the educational intervention, pediatric neurologists would know more about how epilepsy affects children's behavior and learning than pediatricians. The pediatricians, therefore, would learn more than the neurologists from the educational intervention. We posited that increased knowledge would change attitudes toward and possibly provider obstacles to the relevance of mental health problems in children and adolescents with epilepsy in both provider groups. Lastly, we predicted no change in provider mental health care-related management practices immediately after the talk (e.g., time spent on behavioral assessments, interactions with mental health practitioners about their epilepsy patients) in both provider groups.

2. Methods

2.1. Participants

We recruited 18 pediatric neurologists from the University of California, Los Angeles (UCLA), Division of Pediatric Neurology, Children's Hospital Los Angeles, Olive View–UCLA Medical Center County Hospital, and Kaiser Permanente–Sunset because of their large pediatric epilepsy clinics. Recruitment sources for pediatricians included UCLA Pediatric Department clinical faculty who work in outpatient clinics and/or private practices, as well as the Woodland Hill Kaiser Permanente. Approval from the UCLA institutional review board was obtained prior to participant recruitment.

Our research team invited providers to participate in this study by telephone. Of the 152 pediatricians contacted, 18 pediatricians participated in the study and 134 declined participation for the following reasons: lack of knowledge about epilepsy ($n = 2$), lack of interest in the topic ($n = 7$), scheduling conflicts ($n = 13$), planned retirement ($n = 9$), and no other reason given ($n = 121$). As many pediatricians did not return phone calls, despite being called several times, we were unable to ascertain why they did not call back initially.

2.2. Measures

2.2.1. Provider questionnaire

The questionnaire is a 39-item instrument designed to measure provider knowledge of, attitudes toward, and management practices regarding the behavioral and cognitive comorbid conditions of children with epilepsy. The providers rated items on a 5-point Likert-type severity or frequency scale.

Broad topics measuring provider knowledge included (Table 1): (1) effects of epilepsy on behavior and cognition/learning, (2) association of behavioral and cognitive comorbid conditions in pediatric epilepsy with seizure and psychosocial variables, (3) possible cognitive and behavioral adverse effects of AEDs, and (4) drugs used to treat common child behavior problems. Questions on provider attitude included (Table 2): (1) providers' perception of parent's main concern for their child with epilepsy, (2) providers' comfort level assessing mental health needs and prescribing psychotropic drugs for children with epilepsy, (3) providers' perceptions of the benefits of mental health assessment and treatment for these children, and (4) providers' awareness of cultural barriers to mental health care for children with epilepsy.

Questions assessing provider mental health care-related management practices included (Table 3): (1) time available for intake and follow-up examination, (2) inclusion of behavioral assessments in these examinations, (3) adequacy of provider training to conduct behavioral assessments, and (4) provider mental health care referral practices, such as

Table 1
 Provider responses to questions on knowledge of behavioral and cognitive/learning comorbid conditions before and after lecture

	Pediatric neurologist		Pediatrician	
	Pre	Post	Pre	Post
Proportion of children needing behavioral assessment, <i>M</i> (SD)	2.76 (0.92)	1.78 (0.89)	2.33 (1.30)	1.53 (0.80)
Cause of comorbid condition, %				
Biological	0	0	0	0
Environmental	0	0	6	0
Biological and environmental	100	100	94	100
Most frequent types of psychiatric disorders, %				
ADHD	28	44	29	18
Depression	11	11	18	18
Anxiety	17	6	12	11
Simple phobia	5	0	0	0
Impulse control	28	28	29	35
Other	11	11	12	18
Proportion of children needing assessment of learning skills, <i>M</i> (SD)	2.29 (0.98)	1.94 (0.87)	2.44 (1.21)	2 (1.08)
Relationship of behavior difficulties to seizure control, <i>M</i> (SD)	1.72 (0.67)	1.5 (0.86)	1.76 (0.75)	1.76 (1.09)
Adolescents have frequent suicidal ideation, <i>M</i> (SD)	1.94 (0.54)	1.39 (0.50)	2.35 (0.07)	1.39 (0.70)
Stigma and seizure control are child's only problems, <i>M</i> (SD)	3.11 (0.83)	3.56 (0.70)	2.76 (1.09)	3.44 (0.70)
Behavioral and cognitive side effects of AEDs, <i>M</i> (SD)	3.27 (0.46)	3.56 (0.51)	3.12 (0.86)	3.33 (0.97)
Association of learning and behavior problems, <i>M</i> (SD)	2.27 (.57)	2 (0.59)	2.18 (0.64)	2.06 (0.56)
Stress associated with social, academic, and familial problems, <i>M</i> (SD)	2.33 (1.03)	2 (0.84)	2.41 (0.71)	2.22 (0.73)
Differential diagnosis of tired, listless, and apathetic child with epilepsy, <i>M</i> (SD)				
High doses of AEDs	2 (0.50)	1.94 (0.70)	1.94 (0.77)	1.44 (0.70)
Has depression	0 (0.49)	0 (0.54)	0 (0.75)	0 (0.62)
Uncontrolled seizures	2 (0.49)	2 (0.59)	2.75 (0.86)	2.67 (0.84)
Include questions on children's behavior in initial assessment, <i>M</i> (SD)	1.61 (0.78)	1.47 (0.80)	2.56 (1.15)	2.31 (1.04)

Table 2
 Provider responses to questions on provider attitude regarding child's main problems and mental health care before and after lecture

	Pediatric neurologist		Pediatrician	
	Pre	Post	Pre	Post
Comfort using stimulants, SSRIs, neuroleptics, <i>M</i> (SD)				
Stimulants	2.61 (0.98)	2.5(0.97)	2.41 (1.12)	2.12 (1.11)
SSRIs	2.65 (0.93)	2.5 (0.97)	2.94 (2.94)	2.76 (0.75)
Antipsychotics	2.71 (0.84)	2.75 (0.93)	3.23 (3.23)	3.24 (0.75)
Parents' greatest wish for their child, <i>M</i> (SD)				
No seizures	1.28 (0.67)	2.77 (1.11)	1.57 (1.28)	3.06 (1.18)
No behavior problems	2.94 (1.39)	1.94 (1.16)	3.15 (1.21)	2 (1.12)
No learning problems	2.94 (1.05)	2.06 (1.21)	3.38 (1.32)	2.24 (1.30)
Off medication	3.33 (1.46)	4.00 (1.28)	3.36 (1.59)	4.19 (1.37)
No stigma	3.72 (1.13)	3.5 (1.20)	3 (1.19)	3.25 (1.29)
Acceptance/reluctance of mental health referral by parents, %				
Yes	62	70	38	30
No	38	30	62	70
Proportion of children who should have behavioral assessment, <i>M</i> (SD)	1.61 (0.98)	1.44 (0.62)	1.82 (1.07)	1.35 (0.79)
Main obstacle to mental health services for pediatric epilepsy, <i>M</i> (SD)				
Institutional opposition	3.21 (0.97)	3.58 (0.79)	3.11 (1.16)	2.89 (1.05)
Physician training	3.36 (1.08)	3.25 (1.14)	2.42 (1.38)	2.75 (1.48)
Parent reluctance	2.18 (1.07)	2.21 (1.05)	2.18 (0.75)	2.36 (1.02)
Insufficient funds	1.53 (0.87)	1.47 (1.06)	2 (1.15)	2.08 (1.25)
Other	3.25 (2.06)	2.5 (1.91)	1.5 (1)	1.33 (0.58)
Provider awareness of cultural barriers for mental health care, %				
Yes	73	75	27	25
No	27	25	73	75

Table 3
 Provider responses to questions on provider mental health care-related management practices before and after lecture

	Pediatric neurologist		Pediatrician	
	Pre	Post	Pre	Post
Time for intake visit, <i>M</i> (SD)	3.05 (0.80)	2.94 (0.82)	1.53 (0.62)	1.71 (0.68)
Time for follow-up visit, <i>M</i> (SD)	1.67 (0.48)	1.82 (0.64)	1.18 (0.87)	1.24 (0.90)
Enough time for behavioral assessment, <i>M</i> (SD)	4.06 (0.92)	3.83 (0.70)	3.59 (0.87)	3.59 (0.90)
Includes questions on behavior in initial and follow-up assessments, <i>M</i> (SD)	1.65 (0.79)	1.61 (0.77)	2.35 (1.17)	2.29 (0.56)
Adequate training to assess and treat behavior problems, <i>M</i> (SD)	3.6 (1.02)	3.22 (1.16)	4.12 (0.78)	4.00 (0.73)
Enough training to assess and treat learning problems, <i>M</i> (SD)	4.06 (0.80)	3.83 (0.79)	3.59 (1.06)	3.59 (1.06)
Referral sources for children with behavior problems, %				
Parent	47	41	53	59
Teacher	0	0	6	6
Other	53	59	41	35
Ongoing working relationship with a consulting psychologist, <i>M</i> (SD)	3.17 (0.79)	2.89 (0.76)	4 (0.85)	2.65 (1.06)
Ongoing working relationship with a consulting child psychiatrist, <i>M</i> (SD)	2.72 (0.67)	2.59 (0.87)	3.18 (0.81)	2.76 (1.20)
Parents refuse to accept mental health assessment or treatment, <i>M</i> (SD)	2.56 (0.78)	2.41 (0.71)	3.19 (0.83)	3.31 (0.70)
Feedback/communication with consultants on children's condition, <i>M</i> (SD)	2.94 (0.75)	2.94 (0.85)	2.94 (1.12)	2.8 (1.08)
Feedback modifies provider's treatment of child, <i>M</i> (SD)	2.71 (0.77)	2.53 (0.92)	3.25 (0.77)	2.75 (1.06)
Children benefit from mental health assessments, <i>M</i> (SD)	2.23 (0.66)	2.18 (0.88)	3 (0.68)	2.33 (0.82)

type of mental health care consultants used, consultant availability, contact with these practitioners following the consults, and perceived usefulness of mental health practitioner assessments and feedback.

2.2.2. Open-ended questions

Providers also responded to open-ended questions in which they elaborated on their personal perspectives regarding the importance of behavioral assessments and treatment of psychiatric disorders in children with epilepsy. These questions queried providers' awareness of possible obstacles to mental health care including: (1) stigma of a mental health referral in parents of different ethnicities, (2) parental resistance to mental health referrals, (3) difficulties parents face obtaining mental health care, and (4) provider confidence regarding the benefit of mental health care for these children. In addition to providing a fixed response option of "yes/no," the open-ended items had additional lines provided for the respondents to elaborate on their answers.

2.3. Procedures

This study was conducted in accordance with the policies of the Human Subjects Protection Committees of UCLA. Once providers were successfully contacted and agreed to participate in the study, they were given details about the educational intervention and queried about the most convenient time for the lecture to be held. Informed consent was obtained from all participants prior to the educational intervention.

Providers attended a 50-minute lecture on the cognitive and behavioral comorbid conditions of pediatric epilepsy, as well as related biological and psychosocial factors, given by a pediatric neuropsychiatrist with clinical and research experience in pediatric epilepsy (R.C.).

Before the lecture, participants spent 10–15 minutes completing the provider questionnaire. Immediately after the talk, they again completed the same questionnaire.

2.4. Data analysis

Items from the provider questionnaire were grouped together into four broad domains. They included provider knowledge/attitude, training, assessment of behavior and cognition, and perception of obstacles to mental health care. Principal component analysis was conducted for measures within each domain to obtain a reduced number of outcome measures that could be compared pre- and postintervention and across groups (pediatrician vs pediatric neurologist).

To examine the effect of the educational intervention, as well as differences in provider ratings, mixed effects models were estimated with factor scores as the dependent variable. The between-subject factor was type of provider (pediatricians vs pediatric neurologist), and time (before vs after intervention) was the within-subject factor. The interaction provider type \times time was also included in the model, to determine if only one type of provider changed as a result of the intervention. A 0.05 level of significance was adopted.

3. Results

3.1. Principal component analysis

Tables 1–3 list providers' ratings (means (SD) and percentages) of questionnaire items on knowledge, attitude, and management practices, respectively, before and after the lecture. The principal components analysis for the knowledge/attitude domain revealed six components with the following loadings: knowledge about the rate of behavioral (0.84) and cognitive (0.85) comorbid conditions in pediatric epilepsy; seizure control (0.78) and its relationship with behavior and learning disturbances (0.92); frequent psychiatric diagnoses (0.65) and behavioral effects of AEDs (0.73) in pediatric epilepsy; behavioral impact of cognition (0.58), AEDs (0.57), and suicidality (0.58); parental concerns for their children (0.90); and the role of stress in seizures (0.64).

The training domain included provider use of selective serotonin reuptake inhibitors (SSRIs) (0.86), antipsychotic drugs (0.81), and stimulants (0.62) and feelings of competence to assess behavior (0.80) and learning (0.66) in children with epilepsy. The provider assessment of behavior and cognition domain had two components. The first component incorporated the frequency with which providers include questions on behavior and learning in initial (0.86) and follow-up (0.89) examinations of children with epilepsy and how much time they allotted to these evalua-

tions (intake, -0.76 ; follow-up, -0.69). The second component included provider mental health referral practices in terms of whom they referred to (0.76) and if they obtained (0.81) and used (0.86) feedback from these practitioners.

The obstacle domain had three components. The first loaded on provider perception of parental resistance to mental health referrals (0.92) and cultural stigma to mental health care (0.82). The second loaded on provider opinion regarding the benefit of mental health care assessments for children with epilepsy (0.82) and the likelihood that providers would refer children for such assessments if parents are resistant (0.80). The third component loaded on the likelihood that parents would accept a mental health referral for their children (0.88) and provider satisfaction with the time available for assessing behavior in these children (0.60).

3.2. Between-group differences and intervention effects

The mixed effects models comparing knowledge/attitude in the provider groups revealed that pediatricians learned significantly more about the rate of comorbid behavioral and cognitive disturbances (occupation \times time: $F(1, 32) = 4.33$, $P < 0.04$), in addition to the behavioral impact of cognition, AEDs, and suicidality (occupation \times time: $F(1, 32) = 3.95$, $P < 0.05$), than pediatric neurologists after the lecture. Following the lecture, however, knowledge on the interaction of stress, AEDs, and seizure control (time: $F(1, 32) = 11.45$, $P < 0.002$) increased in both provider groups.

With respect to behavioral and cognitive assessments, pediatric neurologists were significantly more aware than pediatricians of the importance of these assessments, as well as the need for feedback to and from mental health consultants (occupation: $F(1, 32) = 13.28$, $P < 0.0009$).

There were no significant between-group differences or changes in provider knowledge about the relationship of seizure control to behavior and learning disturbances. There were also no significant between-group differences or changes in provider knowledge of parental concerns regarding the impact of epilepsy on their children's lives, such as seizure control, behavior problems, and learning difficulties.

The mixed effects model results for the provider training factor indicated no significant occupation, time, or occupation \times time effects. In the provider management practice domain, the mixed effects model indicated that pediatric neurologists inquired about behavior and learning in initial and follow-up examinations of children with epilepsy and provided more time to complete their evaluations than pediatricians (occupation: $F(1, 32) = 16.18$, $P < 0.0003$). There were no significant differences in the second component (i.e., mental health referral practices) by occupation, following the lecture, and no interaction effect of these variables.

In the mental health obstacles domain, the mixed effects models demonstrated the following: pediatric neurologists

were significantly more aware than pediatricians of parental resistance to and the cultural stigma associated with mental health care in children with epilepsy (occupation: $F(1, 28) = 11.35$, $P < 0.002$). The pediatricians, more often than the pediatric neurologists, thought that parents would resist mental health referrals and that there is little benefit from these referrals (occupation: $F(1, 28) = 4.09$, $P < 0.05$). Following the lecture, however, pediatric neurologists and pediatricians thought parents were less likely to resist these referrals (time: $F(1, 28) = 6.22$, $P < 0.02$). Pediatricians, however, thought there was adequate time to conduct behavioral assessments in these children (occupation \times time: $F(1, 28) = 5.15$, $P < 0.03$).

3.3. Open-ended questions

The pediatric neurologists reported great difficulty providing for the mental health needs of their epilepsy patients. They cited insufficient mental health care coverage by insurance companies and government agencies, lack of mental health care professionals with expertise in pediatric epilepsy, and resistance by child psychiatrists and other mental health care clinicians to assessment and treatment of children with epilepsy as reasons for this difficulty. Additional obstacles included lack of bilingual mental health care providers and cultural barriers associated with the stigma of mental health care in African-American, Hispanic, Asian, and Middle Eastern families. Although the majority of providers reported that they would make mental health referrals irrespective of parents' reluctance, providers acknowledged that parental discretion determined whether or not they would proceed with the referral for their child. Finally, with respect to educational enrichment, both pediatric neurologists and pediatricians made it clear that they did not have time to read papers or manuals, watch videotapes, or attend lectures to increase their knowledge on the psychosocial aspects of epilepsy in children.

4. Discussion

As predicted, the educational intervention was effective in delivering knowledge about the impact of epilepsy on behavior and learning, the high rates of comorbid mental health and learning problems, suicidality, and the possible role of cognition and AEDs in behavior and learning in these children. Both provider groups also became significantly more aware of the interactions among stress, behavioral and cognitive side effects of AEDs, poor seizure control, and behavioral comorbid conditions in youth following the lecture. Of note, pediatric neurologists and pediatricians thought parents were less resistant to mental health referrals after but not before the lecture.

As found in pediatric chronic illness [22,23] and in the general population of children [46], the providers were unaware of the great need for mental health referrals in children with epilepsy. Increase in their knowledge following

the brief educational intervention is encouraging for two reasons. First, primary care physicians report they lack knowledge and expertise both on epilepsy [2–5] and on emotions and behavior in children without epilepsy [6,21]. Second, both specialists and pediatricians are important facilitators for the delivery of mental health services in children [33,35,36]. Therefore, increasing their knowledge of the high risk of psychopathology and the unmet mental health needs among these children is essential.

Interestingly, despite their apparent lack of knowledge, both provider groups perceived themselves as competent to assess behavioral and cognitive comorbid conditions in children with epilepsy. This finding goes hand-in-hand with the high rates of prescribing psychotropic drugs, such as stimulants and SSRIs, by pediatricians [47]. Nevertheless, compared with the pediatricians, the pediatric neurologists were more likely to refer children to mental health care, more aware of parental resistance to and the cultural stigma associated with mental health referrals, and more cognizant of the benefit from mental health referrals for these children. Therefore, improving provider knowledge and awareness of the behavioral and learning comorbid conditions of pediatric epilepsy is an important, albeit first, step to reduce provider-based obstacles to mental health care for children with epilepsy, especially in primary care.

To further understand possible obstacles to mental health care for these children, we explored how providers perceive parents' main concerns for children. In contrast to previous reports on both pediatric epilepsy [25,26,48,49] and chronic illness [36,50], we did not confirm that providers described parents as more concerned by illness variables (e.g., seizure control) than by illness-related behavioral and learning problems. Given the study's small sample size, this finding needs to be replicated in a large representative sample of both pediatric neurologists and pediatricians.

On the basis of the open-ended questions, the pediatric neurologists stated that limited resources (e.g., insurance coverage, expertise) for mental health services and lack of mental health professionals with expertise in pediatric epilepsy were important barriers to mental health care in pediatric epilepsy. Inadequate or insufficient medical insurance [51–53] and available professional expertise [2] have also been described as potential structural barriers to mental health care for children with chronic illness.

Although open-ended questions are not applicable to quantitative data analysis, the responses of providers to these questions, together with our quantitative findings, highlighted several issues that have relevant policy implications. First, it is important to determine how best to ensure financial coverage for the assessment and treatment of the comorbid behavioral, cognitive, and linguistic problems found in children with new-onset and chronic epilepsy with average [8,9,54–58] or low [59–61] intelligence quotient scores.

Second, in addition to increasing the number of child psychiatry and psychology clinicians with expertise in pedi-

atric epilepsy, educating child mental health clinicians about epilepsy and the associated behavioral and cognitive comorbid conditions might be a first step in increasing their willingness to work with these children. Third, our findings suggest that there is a need to increase provider knowledge about the behavioral and cognitive comorbid conditions as well as the psychosocial aspects of epilepsy. However, it is unclear who should get this training (pediatricians or pediatric neurologists), as well as when and how should it be delivered. The pediatricians' resistance to enroll in this study, the open-ended responses indicating lack of time and interest in epilepsy, and prior findings demonstrating limited provider knowledge [62,63] underscore the need for other methods to educate providers about the impact of epilepsy on the lives of children and their families. Alternatively, educating parents about the need to assess the behavioral, cognitive, and linguistic comorbid conditions of pediatric epilepsy may facilitate mental health service delivery for their children, given the role parents play in obtaining mental health care referrals from providers for their children [33,36].

Fourth, in both their quantitative and open-ended responses, providers acknowledged that the combined stigma of epilepsy and mental health might deter minority parents from mental health referrals. Although there is evidence for the stigma of mental illness [38] and epilepsy [7,39–41], there have been no studies to date on the combined stigma of epilepsy and mental illness and whether it prevents children with epilepsy and their parents from seeking mental health care. In addition, evidence for variable cultural awareness of both epilepsy [54] and mental illness [20,43,44] across ethnic groups emphasizes the importance of identifying the best way to deliver culturally sensitive information about epilepsy and its mental health comorbid conditions to children with epilepsy and their parents.

Results from this study should be interpreted cautiously because of the difficulty we encountered recruiting pediatricians for this study. Although we designed the study to accommodate providers' schedules, most of them did not return phone calls or showed minimal interest in enhancing their education on this topic. This phenomenon suggests that limited knowledge of, time for, and interest in epilepsy may represent a serious barrier to mental health referrals of these children. In fact, Traynor et al. [64] purported that there needs to be more recognition of the time practitioners put into surveys and that researchers need to consider the additional demands these place on their already busy lives.

Other study limitations include the cross-sectional study design and associated lack of information on whether the changes in provider knowledge and attitudes after the educational intervention were transient or consistent. In addition, the small sample size of providers underscores the preliminary nature of the study's findings and the need for replication in larger representative samples of both pediatricians and pediatric neurologists.

Despite these limitations and the preliminary nature of our findings, they represent a first step toward determining obstacles to mental health care, particularly with respect to the role of providers, in the unmet mental health needs of children with epilepsy. Although our findings indicate a need to increase provider knowledge, they also suggest that this might not be the best way to secure mental health care for children with epilepsy. Given the complex interaction among provider (i.e., expertise), illness severity/disability, psychosocial, cultural, and funding variables in determining access to mental health care for children with epilepsy, future large-scale studies are warranted. Such studies should examine the likelihood of achieving this goal through alternative routes, such as providing funding for mental health care, increasing parents' awareness of the need for mental health care, as well as incorporating modules on epilepsy and its comorbid conditions into the training programs of pediatricians, pediatric neurologists, and child mental health clinicians.

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