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"At a loss of what to do": a qualitative analysis of parents' online discussion forums about their administration of asthma inhalers to their young children

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ABSTRACT

Objective: The difficulties adults have using inhaler devices is well documented but much less is known about how parents administer inhaler devices to young children and the difficulties experienced. The purpose of this article is to explore the underlying concepts and practical issues that parents encounter in administering inhaled asthma medications to their young children.

Methods: This is a qualitative study using applied thematic analysis on parental written discourses from asynchronous online discussion forums on the topic of administration and use of asthma inhaler devices to young children.

Results: "At a loss of what to do" summarizes the experiences parents described when administering inhaler devices to their young children. Parents describe the problems, the situations, the emotions, the decisions, and the confusion they face. They struggle with their child's resistance and the associated conflict, describing their own and their child's distress. Results highlight the coping strategies used in administration, how parents decide whether to use coercive measures or not, their help-seeking endeavors, together with the assurance they give to themselves and others after administration.

Conclusion: The online discussions highlight parents' distress, lack of preparedness, and understanding of administering inhaler devices to young children. While the prevalence of the problem cannot be estimated from our data, it illustrates a need for some healthcare professionals to review their own knowledge and skills in administration of inhaled medication to younger patients, and their provision of patient and family centered care.

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Introduction

Asthma is the most common chronic lung disease of childhood, affecting 6 million children in the United States (1). According to Centers for Disease Control and Prevention (CDC), ~1 in 6 children with asthma in the United States needs to visit an emergency department each year, with 1 in 20 hospitalized (1). Poor asthma control is associated with poor inhaler technique and poor self-reported adherence (2), leading to poor clinical outcomes. In addition, poor control leads to unnecessary expenditure and, for young children, the detrimental psychological impact of emergency visits and hospitalization. Conversely, good inhaler technique is likely to be associated with improved asthma control.

Persistent misuse of inhaler devices, including metered dose inhalers and other inhalers, is frequent among the adult population (3, 4). In a recent systematic review, the prevalence of correct inhaler technique

among adults was only 31% in the areas of coordination of steps and inspiration techniques (5). In adults with asthma, it is recognized that there are many different factors that affect inhaler competence, including physical capabilities, beliefs about medications, adherence, patient device preference, inhaler technique training provided by professionals, and religious and cultural beliefs (6). Similarly, few school-aged children can use an inhaler properly, with correct technique ranging between 18% and 97% for the steps involved (7).

Inhaler administration in young children is highly dependent on parents as very few preschoolers are able to plan and administer their own treatment (8). Families with young children face unique challenges in asthma care. A qualitative study exploring parental perceptions on management of their child's asthma highlighted their struggles and their need for stronger partnerships with professionals when managing their

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child's asthma, as well as a desire for ongoing asthma education (9). A descriptive review on adherence in young children with asthma identified a requirement to recognize the strains and stresses generated for parents, the challenges of adherence monitoring over time, the impact of the asthma device on both parents and children, as well as parental concerns when treating the early or prodromal symptoms of an asthma exacerbations (10). It is essential for parents to acquire proper inhaler techniques to ensure successful treatment of asthma for their *young children*, in advance of teaching them as they grow older to independently administer medications.

To further investigate parents' experience on administering inhaler devices to their young children, we adopted a novel approach using online parental narratives and questions relating to the administration of inhalers to young children. One advantage of collecting online narratives is the accessibility of people whose voices have been previously unheard or are geographically removed from the researcher (11, 12). Online discussion forums are prevalent and generally accepted platforms for parents to share common concerns. It is recognized that participants in online discussion forums (be they patients, parents or caregivers) share powerful stories from the first-person perspective, interact with their peers, and elicit support, information, and advice from them (13, 14). Asynchronous online discussion forums of relevant topics can provide a source of data which is flexible, spontaneous, and rich for a qualitative analysis (15). The data are naturalistic in textual format, publicly available, and therefore of low cost. Researchers can collect substantial amounts of data without undertaking interviews or transcriptions (12).

This study aims to explore, by analyzing discussions on the online forums, parental experiences of administering inhaled medication, via spacers, aero-chambers, or nebulizers, to their young children with asthma.

Methods

The study design was a qualitative analytic study on the asynchronous online discussion forums eliciting parents' responses to administration of asthma inhalers to their young children.

Ethical considerations

For ethical reasons, we used only online forum discussions that could be accessed without having to sign in. Due to the public and anonymous nature of online

forum discussions, no personal or demographic data about the sample were available. Institutional ethics board review and informed consent were unnecessary because of the use of open data without personal and demographic details but we complied with the ethical guidelines for Internet-mediated research from the British Psychological Society (16) to ensure anonymity and confidentiality. Website addresses of online discussion forums from which the data were collected are not disclosed. Quotes presented in the results section have all been entered again into search engines to confirm they are not traceable to the original postings. If traceable to identified websites, paraphrasing of the quotes was undertaken to maintain anonymity and confidentiality.

Data collection

We identified websites where parents discussed the care of children with asthma by conducting searches in web search engines (i.e., UK-based Google, Yahoo, and Bing) using English only search strings such as "mothers parents taking care of children with asthma forums," "mothers parents mom dad mommy daddy children child son daughter asthma forums," and "children's asthma problem experience with medications medication forum." This resulted in the identification of 28 websites, which were screened to confirm their relevance to the research topic, whether single discussion forum threads or larger active parenting websites. Each of the identified 28 websites was further searched with advanced titles searches, to identify more discussion forum threads. For instance, instead of using the term *toddler*, keywords like *dd* (*dear daughter*) and *ds* (*dear son*) were added as they are common Internet abbreviations.

Data analysis

We used applied thematic analysis employing a predetermined set of transparent procedures to generate themes from our textual data (17). Downloaded transcripts from online discussion forums were read repeatedly to ensure familiarity with the data and the data were imported into NVivo to manage data reduction. First-level coding was conducted to identify key structural topics. Forty-eight topics were identified and these topics were then reviewed individually to determine their relevance to the research aims. The quotes in these topics were qualitatively compared to generate themes and subthemes. Finally, preliminary themes and subthemes were presented and discussed

Table 1. Themes of parents' experiences in administering asthma inhaler devices.

The problem: child's resistance to administration of asthma inhaler
The situation: conflict between parent and child in administration
The emotions: distress over the administration
• Parent's distress • Child's distress
The decision: to use or not to use coercive measures
• Reasons for using coercive measures ◦ "It is for their good" ◦ "It is ok to scream or cry" • Reasons for not using coercive measures ◦ Concern for hurting or traumatizing the child • Coping strategies when using coercive measures ◦ One person pinning or holding down – Burrito method; legs-over-child's arms method ◦ Two persons pinning or holding down • Coping strategies when not using coercive measures ◦ Minimize awareness ◦ Empower the child ◦ Make the process fun ◦ Make it natural ◦ Offer incentives
The confusion: determine the substantive details of administration
The assurance: "child will get used to it"

among the research team members and coding consensus was achieved.

Results

Advanced searches resulted in 65 online forum discussion thread posts from 26 websites, which were downloaded and extracted in April 2015 (see *Data Extraction Summary* at Appendix 1 in the [supplementary material](#)). Not all online discussion threads indicated the post-date, but for those that did, there was a wide range between February 2005 and December 2014. A total of 466 unique sender names were identified and these were frequently pseudonyms. The posts revealed that the messages were posted mostly by mothers of young children (i.e., infants, toddlers, and preschoolers).

Results are illustrated with quotes identified with three descriptors: (1) the number of the forum (F), (2) the number of the discussion in the thread post sequence, and (3) the initials of the sender's "name." For example, "F14, 3, UK" would mean the quote comes from forum number 14, is the third discussion to be posted, and was contributed by a parent with pseudo initials "UK."

The overview of the analysis and themes are presented in [Table 1](#).

Overarching theme: "at a loss of what to do"

"At a loss of what to do" summarizes the experiences of parents administering inhaled medication to their

young children with asthma. Parents shared with the online forums their uncertainties about what to do when their child needed inhaled medication, such misgivings often persisted after experimenting with different methods of medication administration and seeking the advice of others.

My toddler has just been diagnosed with asthma, but I'm at a loss as of what to do? (F14, 3, UK)

Feeling like a total failure that I can't manage this! You know when you have such a small window to treat before hospital visit needed, and I can't get on top of it at home. (F13, 2, ES)

So I am now wondering if anyone has any tips? We tried following the directions and giving 1 puff and getting her to breathe in on the other side of the chamber, but she said she didn't taste or feel anything? We did the second one but it didn't seem to do anything either. (F17, 1, LG)

Parental "loss of what to do" originated from five sources: (1) the problem arising from child's resistance to the administration of asthma inhaler, (2) the situation characterizing the conflict between parent and child in administration, (3) the emotions of distress expressed by both parent and child before and during the administration, (4) the parental decision whether to use coercive measures in administration and their reasons, and (5) the confusion of determining the substantive details and steps of administering different asthma inhalers. Parents described the coping strategies adopted as they endeavored to improve

medication administration to their children, whether with and without using coercive measures. Despite all these challenges, parents expressed optimism and gave assurance to themselves, and others, that the child would get used to the situation.

The problem: child's resistance to administration of asthma inhaler

The problem that frequently drove parents to seek help online was their child's active resistance to the administration of the asthma inhaler and/or its accessories; for example, spacer device.

My son was diagnosed with asthma and now needs an inhaler. He is VERY resistant to using it. I tried a lot of logical approaches and got nowhere. I am not sure what my DH (dear husband) said but DS (dear son) did try and is now crying and upset. DS said the inhaler hurt his tongue and totally refuses to try again. (F9, 2, LE)

Our son of 18 months was given an inhaler for what they suspect is asthma, and we were told to give it to him every day. He certainly refused the mask, and we've now got one of those large plastic cones to try, but every time he tries he goes wild, and gets really upset. (F7, 1, SC)

The situation: conflict between parent and child in administration

The situations described by parents were the constant conflicts and fights between their parental responsibility to administer the inhaled medication and the child's resistance.

At first with DS it was a constant fight to get it into him (F7, 17, SZ)

Well title says it all really.... He had to have it 4 times and it got increasingly difficult as we went along. I am expecting battles tomorrow. (F7, 20, CB)

He disliked the enormous device he was first given and it would take my husband and I both pinning him down to administer it, all 3 of us would end up stressed and in floods of tears. (F7, 16, CM)

The emotions: distress over the administration

Parents described how both their child and themselves were distressed, the former as the recipient and the latter as the administrator of the inhaled medication. Children "hated" it and were "upset" about the

process with crying and screaming common behavioral manifestations of their distress.

We ended up traumatizing him with all the inhaler wrestling matches - he also had nightmares about it and used to cry whenever it was time to take the inhaler. (F1, 5, PJ)

When DS had to use an inhaler he hated it... But it was not an option for him not to ... He screamed like he was being killed ... I felt it was Ok for him to cry for a minute. (F9, 1, RM)

The trouble is that he will not use his inhaler. The last twice we have tried he has become so worked up he vomited. (F7, 28, HMB)

Parents were very disturbed by their child's emotional distress; they reported feeling "horrible," "heartbroken," and "distressed" seeing their child's discomfort before and during the administration.

It's horrid. It's even more horrid when you're out in public and people look at you like you are harming them. (F6, 5, LT)

Yes, we used to go through the big agony of giving the inhaler which in our house is known as the gas mask. Our son had his worst tantrum ever in front of the nurse—I cringe now thinking about it. (F7, 30, H)

She too cried a lot when she saw us getting the inhalers ready and used to thrash around as we held it to her face. It was a case of giving her a bear hug and trapping her hands and legs. *Was heart-breaking.* (F8, 2, ET)

The decision: to use or not to use coercive measures

Parents recognized both advantages and disadvantages of using coercive measures, as well as discussing the coping strategies adopted if using coercion or not when administering inhaled medications. Sometimes parents could not decide which approach was best for their child.

Right now it takes my husband and I both and she screams the whole time. Part of me says that's probably not a bad thing because then the medicine is getting into her lungs, but another part of me is feeling awful for having to do this! (F18, 1, AY)

Reasons for using coercive measures

"It is for their good". Parents, believing that taking the medication is beneficial for their child, were prepared to adopt coercive measures, even if hurtful,

considering it preferable to their child having an asthma attack or needing to go to the hospital.

Just grab him and force him to take it. it's for his own good. (F14, 37, C)

I was just hopeful that there was a nice way to do it as I find it so difficult to be the bad guy! But, as you all say, *it's for his own good*. (F10, 3, LH)

I was very good in the early days of holding my son and using one arm to hold down his arms while slightly leaning on him so he couldn't kick his legs. It sounds barbaric but I wasn't harming him and *he got the medication he needed*. (F10, 2, AI)

"It is ok to scream or cry". Many parents were under the impression that it did not matter if their child cried or screamed during the administration of the inhaled medication. They understood that crying or screaming might facilitate the child taking in more frequent or deeper breathes which would promote the absorption of the medication.

The hospital always tells me it's good if she's crying because she's breathing in lots of air, therefore getting the inhaler! (F7, 7, GM)

I think you just have to sort of pin them down and get on with it, if they cry it's good in a way 'cos they are inhaling at least. (F1, 2, J)

It seems very cruel to continue when they are crying, but on the positive side, their airways are fully extended and receive the medication much better. (F10, 5, TB)

Hopefully she can make the transition to a fun game—otherwise, as much as it's not fun—you are right and screaming certainly does ensure she gets the medicine! (F18, 1, DT)

Reasons for not using coercive measures

Concern for hurting or traumatizing the child.

Parents were concerned that they would hurt or traumatize the child psychologically if they use coercive measures during administration.

Does anyone have tips for nebulizing a 1 year old? It was easy in the doctor's office because she was so sick she didn't fight the mask. Now that she is feeling better it's like wrestling a rabid 18lb raccoon. ... I've been basically putting her in a modified headlock, which doesn't work that well. *I'm also afraid I'll hurt her if I restrain her too firmly*. (F26, 1, AY)

In the ward the asthma nurse said "you've got to pin him down and force it on him" but that seems so

horrible, the time we tried he seemed *totally traumatized*. (F7, 1, SC)

Coping strategies when using coercive measures

One person pinning or holding down. Parents most frequently described methods of forcefully holding the child down while they administered the inhaler medication alone.

Even when he doesn't want to take his medicine it is now easy for me on my own. I sit him on my lap, hold him tight to me facing away and hold the face mask to his face. (B1, 1, AY)

Parents described two specific methods used when they were alone to administer the medication: the burrito method and the leg-over-child method.

Burrito method. This method involves wrapping the child with a blanket or towel so that their arms are unable to block the administration of inhaler medication.

We usually recommend wrapping them in a blanket or bath towel to keep hands out of the way. ... The little ones also learn very quickly that once they are wrapped it is going to happen and it gets easier and quicker. (F7, 5, MJ)

Legs-over-child's arms method. This method involves restraining the child by the parent sitting on the floor and placing the child's head between the legs and locking the child's arms underneath the legs. Then the parent has both hands free to administer the inhaler medication.

My paediatrician gave us an excellent technique for giving it to an infant. Lie the baby down on the bed and sit with your legs down either side, their head at the top of your legs and place their arms under your legs. This holds them in place and you don't have to use any force and you can hold their heads steady between your legs when you put the mask over their face. (F16, 1, RH)

Two persons pinning or holding down. Parents described of managing the moving child by having one person holding the children and the other person administering the inhaler medication.

We have to give her the Ventolin through the spacer by holding her down, with one of us holding each side of her head, while the other one does the spraying (F5, 1, GO)

Coping strategies when not using coercive measures

Minimize awareness. Parents used distraction such as tickling and funny noises, songs and music, television, story reading, or games to downplay the stress of the

administration process. Some chose to administer the inhaler or nebulizer treatment on the child while they were sleeping. While some children responded positively on receiving medication while sleeping, others might wake up, fight, and resist the treatment.

Try tickling him or making him laugh somehow, as that will distract him and also helps him inhale the medicine. (F10, 3, RP)

We decided to sing to my daughter, Twinkle Twinkle was the song of choice. She ended up joining in the actions and the whole thing was a lot less of a nightmare. Distraction was the key, I think. Good luck! (F7, 4, BB)

Sleeping did work the first night once (when he was really poorly) but he was sleeping so lightly that it was the only successful time! (F1, 1, XR)

Empower the child. Parents shared the successes achieved by putting the child “in charge” of medication administration. Letting the child mimic giving inhaled medication through play with toys or people helped them get familiar and comfortable with the process. Another approach used to empower the child was to explain to them how the procedure could make them feel better.

Seemingly if you let them play with it, and give doses to their teddies they get more used to it. (F7, 9, LN)

We found that by mommy and daddy (and even the cat) pretending to have a go and getting her to show off to people and ... she seems to have finally adjusted but it has taken a while, she also has a second chamber and an empty inhaler that she plays with giving her dolls and teddies their medicine! (F20, 1, AM)

We tried lots of different things too but the things that helped the most were letting him put it on our faces, letting him try to depress the inhaler into the air so that he could see what was going on. (F8, 1, W)

I would sit him down and tell him that they are to make him feel better and he should take them. (F7, 6, BV)

Make the process fun. Parents made inhaler administration fun by decorating it with pictures chosen by the child or using songs and games to engage them.

Things we've done to make it more 'fun' is to let them decorate their spacers with stickers, let their teddy bears have a puff, use the countdown method before the spacer rocket blasts off (if they count out loud at least they're breathing it in). (F10, 1, HB)

Make it natural. Parents observed that if they made inhaler administration integral to the day's routine, for instance, making it at the same time and in same place each day, it increased the child's acceptance.

To start with he used to go into massive meltdowns whenever he had to have his inhalers. Making it part of his routine really helped us. Make sure that DS uses it at the same time(s) each day so that it becomes as much of a habit as brushing his teeth. (F7, 9, CT)

Offer incentives. Parents described giving rewards and praise when the child complied. Both tangible rewards, such as favorite food or favorite activities, and intangible rewards, such as excessive praise, were used to coax and encourage compliance.

I would give my son a nice sticker for his spacer every time he used it ... reward him with chocolate every time he uses it. Till he gets used to it. ... Lots of cheers. (F7, 11, AD)

She prefers to hold it herself, and we have always lavished so much praise on her for doing it that now she says 'good girl' when she sees the puffer coming. (F7, 11, HJ)

The confusion: determine the substantive details of administration

Parents were often confused and unsure about the types of drug delivery devices optimal for children of different ages, e.g., whether their child should use a nebulizer over a metered dose inhaler (MDI) with or without a spacer/valved-holding chamber. They questioned the effectiveness of different devices, given their own or child's struggles in using the device. They also asked questions about specific steps in the administration procedure, particularly regarding an MDI with a spacer/chamber. They asked such things as how to administer puffs from a MDI, how to breathe using a spacer, and how long it takes the child to inhale the correct amount of medication.

Yes definitely, because with the nebulizer they breathe all the medicine in naturally vs the inhaler where we are forcing them to take a deep breath. My daughter is 2 and still doesn't really understand much of what I say so I would definitely use the nebulizer over the inhaler. (F19, 1, ED)

So we used the mask for the first time yesterday. I think this is the first time he got his full dose! But he fought it and my husband wanted me to go back to the nebulizer. I told him as would see how this goes first. (F4, 1, BH)

My DS is 11 months old and fights it as well, but at least the spacer is much quicker than the nebulizer (which he fights, too)! Our pulm [*pulmonologist*] told us 6 breaths and he should have all of the medication. Our spacer has a little flap that moves in and out every time he takes a breath. We also have a mask that doesn't have that, so with that one I would try to count his breaths based on the mask fogging up. Hope that helps, and give the spacer a chance, it is so much quicker! (F4, 1, BN)

That is exactly what DS has. So if I can't get him to count to 5 has he not got enough? (F7, 8, MB)

The assurance: "child will get used to it"

Through trial and error of different approaches, using coercive measures or not, parents had certain confidence that things would get easier if they "kept at it," especially should the child begin to feel the benefits of the medication. Parents used positive declarations to encourage other parents online.

Your doctor is right—as frustrating as it is, you DO have to just get on with it really, trial and error until you find something that works. Just persevere and I promise you she WILL get used to it! (F10, 2, AI)

The doctor placed her on a nebulizer with albuterol. She hated it at first, cried and struggled, ... After the first few sessions of struggling, she calmed down and even would even fall asleep if it was close to nap time while on the nebulizer treatments. ... I think the struggle is worth it, and talking with a lot of parents, all the kids seem to have the same reaction, but grow accustomed to inhaler treatments, especially once they feel the results. (F18, 1, SW)

The greatest news is that most toddlers generally get used to the neb machine within 2–4 days because it becomes routine to them. (F20, 1, US)

Discussion

The purpose of this qualitative study was to investigate the phenomenon of parents' experience in administering inhalers to young children with asthma, to better understand the challenges associated with adherence, the impact on their families, and the coping strategies adopted. The results highlighted that some parents were at a complete loss of what to do when given inhaled medication for their child. In our presentation of results, we take each approach to medication administration in turn, but in reality, parents were often using multiple approaches simultaneously, similarly parents did not dichotomize their

use of coercive measures or none coercive measures. In their desire to find a quick resolution to their problems, parents use a combination of methods and a trial-and-error approach. They appreciated the complexity of child's medical condition, age, personality, etc., such that no solution is a one-size-fits-all. This led us to think that parents' experience of "what works" for them might not be necessarily useful for others in their own highly individualized situation. This suggests that over and above the provision of any generic advice and strategies, there remains a need for each family to benefit from a consultation to discuss an individualized, tailored management plan for their child's respiratory problem, including inhaler technique.

Our results support the previous findings as well as reveal findings which were not previously documented. In particular, our results expose some misperceptions, held by parents and healthcare professionals, that crying was acceptable, or even welcome, during the inhaling of medicine. Finally, clinicians need to expand their views of treatment beyond the first step of prescription, adopting a patient and family centered care (PFCC) approach and continuity of care.

Themes in relation to previous findings

The administration of asthma inhalers appears to generate child resistance and parent–child conflict very similar to what has been documented previously in the context of giving oral medicines to young children (15). There are similarities in the modes of administration chosen, with some parents selecting forced administration while others opt for disguising administration (e.g., minimize awareness) or open administration (e.g., making the process fun by involving the child in the process). The recognition of parental difficulties administering an inhaler with spacer or chamber attachment has been previously documented (18). Unfortunately, these technical difficulties experienced are not confined to parents, but prevalent in health professionals also, where it is estimated that only between 15% and 69% are able to demonstrate correct inhaler use and knowledge (7). Parental exposure to this lack of professional know-how could in part explain why in our data parents expressed little reliance on healthcare professionals as a resource to be accessed for help with medication administration. The resolution of these challenges needs to be multifaceted, including inhaler technique training for health professionals, inhaler technique training for parents,

and enhancement of the healthcare provider–caregiver alliance, with greater PFCC (6, 9).

Parents' misguided perceptions

It was once a commonly held belief that a crying child receives a greater proportion of an inhaled drug. We are now better informed, and the ERS/ISAM Task Force Consensus Statement (19) recommends not administering inhalers to a struggling child because it is difficult to achieve a good seal around the facemask and shallow, rapid breathing deposits the inhaled drug in the upper rather than lower airways. In this study, a tolerance of, or even willingness to, use upsetting coercive measures were justified because of the belief that rapid breathing would not reduce and may facilitate drug delivery. Encouragingly, there were a small proportion of parents who were avoiding using coercive measures as they knew correctly, that for optimal drug delivery and absorption, the child should be calm and breathing deeply. This correct understanding was illustrated by comments such as “Don’t pin him down - a crying, screaming child shallow breathes and the medication won’t be as effective” (F7, 1, SM).

Importance of patient and family centered care approach and continuity of care

The confusion apparent in the parental discourse reflected their inadequate preparedness to execute the various components of inhaler administration. The real—or perceived—inadequate information and training provided was necessitating them becoming self-reliant and seeking nonprofessional support for asthma management, suggesting a weaknesses in their existing healthcare provider–parent partnership. A strong alliance between clinicians, child patients, and parents is essential and the adoption of a PFCC approach has the potential to advance the quality of asthma care (20). Within this framework of care, the clinician respects the caregivers’ values in the decisions about care and their roles in improving care practices and outcomes (21). Clinicians can help parents reflect upon what has been prescribed and influence parents’ beliefs about the importance of inhaled medication in asthma management. Further research is needed optimize PFCC in the context of asthma and to evaluate its effectiveness in disease management. Recognizing that different cultural groups may have different health belief systems about illness management necessitates the replication of such research in different ethnic groups (22).

The confusion apparent in the parental discourse may also stem from a lack of ongoing review and continuity of care. As discussed earlier, asthma treatment plans and devices for children need to be adjusted to reflect the child’s development and their changing disease. So a one-off consultation will not suffice; continued monitoring enables a stepped-care approach to pharmacological management together with selection of the appropriate inhaler device to match the size and age of the child, and family preferences. Continuity of care can maximize the success of the treatment, and lack of continuity increases pediatric emergency department visits and related healthcare costs (23). Continued monitoring of asthma self-management by trained medical professionals is considered pivotal in a holistic treatment approach for the child with asthma or respiratory problems (24). Asthma education needs to extend beyond written instructions, to include verbal instructions, demonstrations, and practice. One-on-one training is highly recommended to achieve a substantial increase in correct inhaler usage (25, 26) and the most effective training technique in correct inhaler use has been found to be verbal instruction combined with physical demonstration (6). Asking the child and the caregivers to demonstrate the procedure independently after training to affirm learning may further optimize the administration (24). The use of digital technologies, such as app-based or Internet-based tools, which include tracking of adherence, or provide a combination of video lectures, real-time one-on-one online training, and coaching, has potential to disseminate training and to consolidate the skills of both clinicians and caregivers (27). Interactive electronic games or apps could also potentially improve young children experience in using spacer devices and improve their adherence (28).

Strengths and limitations

This study uses a novel approach to data collection, where the participants are unaware of the researcher; this is sometimes referred to as nonreactive research (29), in contrast to active approaches, such as interviews or surveys. When participants are aware of the researcher, there is a risk that they respond in a socially desirable fashion, adapting their accounts, conscious of being under scrutiny. The complete anonymity offered by online discussion enables a frankness which can be difficult to replicate in face-to-face interviews. Not only has the data greater validity, its

collection is less labor-intensive and it does not require transcription.

There is a potential theoretical weaknesses of digital data from online forums; you cannot be sure whether members are really who they claim to be. There is no way to clarify their demographics, such as age, gender, or nationality, to draw inferences for further analysis and it has been suggested that “In cyberspace, participants can create and assume identities limited only by their imaginations” (p(0).972) (30). In addition, we may not have a sense of balance of perspectives as many parents who do not have problems about the administration of medication are less likely to access the forum and express their views. While the researchers attempted their best to find all relevant online discussion forums, there is the possibility that additional posts might be identified if different search terms were used. A further minor limitation is the lack of opportunity for triangulation of the data when the contributors are members of an asynchronous online forum discussion. As not all people have access to the Internet, the data may not be representative of people of all socio-demographic and income groups, but for qualitative analysis, where breadth of response rather than generalizability of the findings is important, this limitation is less important.

Conclusion

Our data emphasize how the prescription of medication and a delivery device is not of itself adequate to enable families to care for respiratory problems in their young children. Equal attention needs to be given to demonstrating how to use the prescribed device and reviewing technique at subsequent appointments. In some families, considerable stress and conflict is generated when dealing with the administration of asthma medication. In these instances, effective management requires health professionals building a stronger alliance with the parents using a PFCC approach, tailoring management plans, monitoring progress, educating the child and family, and helping parents develop techniques to minimize the conflicts that arise from medication administration.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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References

- Centers for Disease Control and Prevention. Asthma attacks declining among U.S. children: more work needed to continue progress [Internet]. 2019. Available from: <https://www.cdc.gov/media/releases/2018/p0206-vs-childhood-asthma.html>
- Giraud V, Allaert F-A, Roche N. Inhaler technique and asthma: feasibility and acceptability of training by pharmacists. *Respir Med* 2011;105:1815–1822. doi:10.1016/j.rmed.2011.07.004.
- Cochrane MG, Bala MV, Downs KE, Mauskopf J, Ben-Joseph RH. Inhaled corticosteroids for asthma therapy: patient compliance, devices, and inhalation technique. *Chest* 2000;117:542–550.
- Melani AS, Bonavia M, Cilenti V, Cinti C, Lodi M, Martucci P, Serra M, Scichilone N, Sestini P, Aliani M, et al. Inhaler mishandling remains common in real life and is associated with reduced disease control. *Respir Med* 2011;105:930–938. doi:10.1016/j.rmed.2011.01.005.
- Sanchis J, Gich I, Pedersen S, Team ADML. Systematic review of errors in inhaler use: has patient technique improved over time? *Chest* 2016;150:394–406. doi:10.1016/j.chest.2016.03.041.
- Price D, Bosnic-Anticevich S, Briggs A, Chrystyn H, Rand C, Scheuch G, Bousquet J, The Inhaler Error Steering Committee. Inhaler competence in asthma: common errors, barriers to use and recommended solutions. *Respir Med* 2013;107:37–46. doi:10.1016/j.rmed.2012.09.017.
- Gillette C, Rockich-Winston N, Kuhn JA, Flesher S, Shepherd M. Inhaler technique in children with asthma: a systematic review. *Acad Pediatr* 2016;16:605–615. doi:10.1016/j.acap.2016.04.006.
- Brown JV, Avery E, Mobley C, Boccuti L, Golbach T. Asthma management by preschool children and their families: a developmental framework. *J Asthma* 1996;33:299–311.
- Peterson-Sweeney K, McMullen A, Yoos HL, Kitzman H. Parental perceptions of their child's asthma: management and medication use. *J Pediatr Health Care* 2003;17:118–125. doi:10.1067/mp.2003.31.
- Graves MM, Adams CD, Portnoy JM. Adherence in young children with asthma. *Curr Opin Allergy Clin Immunol* 2006;6:124–127. doi:10.1097/01.all.0000216856.85021.11.
- Robinson KM. Unsolicited narratives from the Internet: a rich source of qualitative data. *Qual Health Res* 2001;11:706–714. doi:10.1177/104973201129119398.

12. Hookway N. 'Entering the blogosphere': some strategies for using blogs in social research. *Qual Res* 2008;8:91–113. doi:[10.1177/1468794107085298](https://doi.org/10.1177/1468794107085298).
13. Bhamrah G, Ahmad S, NiMhurchadha S. Internet discussion forums, an information and support resource for orthognathic patients. *Am J Orthod Dentofacial Orthop* 2015;147:89–96. doi:[10.1016/j.ajodo.2014.08.020](https://doi.org/10.1016/j.ajodo.2014.08.020).
14. Tanis M, Das E, Fortgens-Sillmann M. Finding care for the caregiver? Active participation in online health forums attenuates the negative effect of caregiver strain on wellbeing. Berlin: Walter de Gruyter GmbH & Co. KG; 2011.
15. Bergene EH, Rø TB, Steinsbekk A. Strategies parents use to give children oral medicine: a qualitative study of online discussion forums. *Scand J Prim Health Care* 2017;35:221–228. doi:[10.1080/02813432.2017.1333308](https://doi.org/10.1080/02813432.2017.1333308).
16. British Psychological Society. British Psychological Society. Ethics guidelines for Internet-mediated research [Internet]. 2013. Available from: www.bps.org.uk/publications/policy-andguidelines/research-guidelines-policydocuments/research-guidelines-poli
17. Guest G, MacQueen KM, Namey EE. Applied thematic analysis. Thousand Oaks, CA: Sage; 2011.
18. Grover C, Armour C, Asperen PPV, Moles R, Saini B. Medication use in children with asthma: not a child size problem. *J Asthma* 2011;48:1085–1103. doi:[10.3109/02770903.2011.624234](https://doi.org/10.3109/02770903.2011.624234).
19. Laube BL, Janssens HM, de Jongh FHC, Devadason SG, Dhand R, Diot P, Everard ML, Horvath I, Navalesi P, Voshaar T, et al. What the pulmonary specialist should know about the new inhalation therapies. *Eur Respir J* 2011;37:1308–1417. doi:[10.1183/09031936.00166410](https://doi.org/10.1183/09031936.00166410).
20. Harper FWK, Eggly S, Crider B, Kobayashi H, Kathleen RN, Meert L, Ball A, Penner LA, Gray H, Albrecht TL. Patient-and family-centered care as an approach to reducing disparities in asthma outcomes in urban African American children: a review of the literature. *J Natl Med Assoc* 2015;107:4–17. doi:[10.1016/S0027-9684\(15\)30019-5](https://doi.org/10.1016/S0027-9684(15)30019-5).
21. Millenson M, Shapiro E, Greenhouse P, DiGioia A. Patient-and family-centered care: a systematic approach to better ethics and care. *AMA J Ethics* 2016;18:49.
22. Arcoleo K, Zayas L, Hawthorne A, Begay R. Illness representations and cultural practices play a role in patient-centered care in childhood asthma: experiences of Mexican mothers. *J Asthma* 2015;52:699–706. doi:[10.3109/02770903.2014.1001905](https://doi.org/10.3109/02770903.2014.1001905).
23. Snyder D, Thomas O, Gleeson S, Stukus D, Jones L, Regan C. Reducing emergency department visits utilizing a primary care asthma specialty clinic in a high-risk patient population. *J Asthma* 2018;55:785–794.
24. Van Bever H. Holistic care of children with asthma. Singapore: National University Hospital, Medical Grapevine; 2010:24–25.
25. Lee-Wong M, Mayo P. Results of a programme to improve house staff use of metered dose inhalers and spacers. *Postgrad Med J* 2003;79:221–225. doi:[10.1136/pmj.79.930.221](https://doi.org/10.1136/pmj.79.930.221).
26. Aydemir Y. Assessment of the factors affecting the failure to use inhaler devices before and after training. *Respir Med* 2015;109:451–458. doi:[10.1016/j.rmed.2015.02.011](https://doi.org/10.1016/j.rmed.2015.02.011).
27. Kikidis D, Votis K, Tzovaras D. MyAirCoach: designing a mobile application for the education of patients regarding asthma disease. In 2015 International Conference on Interactive Mobile Communication Technologies and Learning (IMCL); 2015, Thessaloniki, Greece, IEEE.
28. Aslam TM, Shakir S, Murray C. Feasibility study of interactive game technologies to improve experience with inhaler spacer devices in young children. *Pulmon Therap* 2016;2:189–197. doi:[10.1007/s41030-016-0023-1](https://doi.org/10.1007/s41030-016-0023-1).
29. Hine C. Internet research and unobtrusive methods. *Soc Res Update* 2011;61:1.
30. Smith A, Stewart B. Body perceptions and health behaviors in an online bodybuilding community. *Qual Health Res* 2012;22:971–985. doi:[10.1177/1049732312443425](https://doi.org/10.1177/1049732312443425).