

# Health Literacy in Pediatric Consultations on Allergy Prevention

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## ABSTRACT

**Background:** The first 3 years of life offer an opportunity to prevent allergic diseases. Pediatricians are an important source of health information for parents. However, a certain degree of health literacy is necessary to understand, appraise, and apply preventive behavior, which can be supported by health literacy (HL) sensitive consultations and a HL friendly environment. **Objective:** In this study, we want to shed light on how pediatricians in outpatient care in Germany advise on early childhood allergy prevention (ECAP) and how they consider parental HL. **Methods:** We conducted 19 semi-standardized telephone interviews with pediatricians from North-Rhine-Westphalia and Bavaria. The interviews were audio-recorded, transcribed, pseudonymized, and subjected to content analysis. **Key Results:** Current ECAP recommendations were well known among our sample. Despite the shift of evidence from avoidance of allergens toward early exposure, providing advice on ECAP was considered non-controversial and it was widely assumed that recommendations were easy to understand and apply for parents. However, ECAP was treated as an implicit topic resonating among others like infant nutrition and hygiene. Regarding HL, our interview partners were not aware of HL as a concept. However, they deemed it necessary to somehow assess parental information level and ability to understand provided information. Formal HL screening was not applied, but implicit strategies based on intuition and experience. Concerning effective HL-sensitive communication techniques, interviewees named the adaptation of language and visual support of explanations. More advanced techniques like Teach Back were considered too time-consuming. Medical assistants were considered important in providing an HL-sensitive environment. Time constraints and the high amount of information were considered major barriers regarding HL-sensitive ECAP counseling. **Conclusion:** It seems warranted to enhance professional education and training for pediatricians in HL and HL-sensitive communication, to reach all parents with HL-sensitive ECAP counseling. [*HLRP: Health Literacy Research and Practice*. 2024;8(2):e47–e61.]

**Plain Language Summary:** We asked pediatricians how they advise parents on prevention of allergy in children. We found that pediatricians were well aware of the recommendations on allergy prevention, but they did not pass on all the information to parents. The HL of parents (that is the ability to find, understand, appraise, and apply health information) was not an important issue for the doctors.

Allergic diseases, including allergic rhinitis, food allergy, asthma, and atopic dermatitis are a major public health concern (Asher et al., 2006; Bergmann et al., 2016; Peters et al., 2017). Preventive measures are crucial for optimizing health outcomes across the lifespan and may reduce the risk of allergies, particularly when addressed in young children (Caffarelli et al., 2018; Morniroli et al., 2021). However, guidelines and recommendations regarding early childhood allergy prevention (ECAP) are complex and keep changing. In 2010, the official German recommenda-

tion regarding the introduction of solid food changed from avoidance of allergens to early exposure (Muche-Borowski et al., 2009). This change has been confirmed in 2014 and 2022 (Kopp et al., 2022; Schäfer et al., 2014). However, knowledge around ECAP is still incomplete and new studies and recommendations are published continuously. Thus, the transfer of the latest knowledge can be challenging, such as when pediatricians are supposed to communicate evidence from research or recommendations from guidelines to parents (Gupta et al., 2020).

Pediatricians are an important and oftentimes highly trusted source of information for parents including ECAP. In Germany, six preventive check-ups are scheduled during the children's first year of life (Schmidtke et al., 2018). In accordance with widely accepted conceptualizations of health literacy (HL), which emphasize health systems' and health care institutions' role in enabling individuals to access, understand, appraise, and apply health information (Sørensen et al., 2012); it is necessary for physicians to consider parental HL during their consultations. Studies indicate that low parental HL is associated with worse health outcomes in children (DeWalt et al., 2007), and parents with low HL also tend to prevent diseases in their children less effectively (de Buhr & Tannen, 2020; Miller et al., 2010; Morrison et al., 2019). However, several studies have shown that health care professionals often overestimate their patients' HL (Dickens et al., 2013; Griffeth et al., 2022). This overestimation may cause misunderstandings, especially as those with low HL tend to ask fewer questions (Katz et al., 2007; Menendez et al., 2017). Davis et al. (2013) highlight the importance of HL regarding health promotion in pediatric primary care, concluding that targeted health information is needed to ensure understanding and application, and they are suggesting that HL screening in pediatric primary care settings is essential.

This study aims to shed light on how HL is considered in pediatric consultations with ECAP as a use case. Our objectives were to explore how pediatricians advise on ECAP, to what extent and how they assess whether parents are health literate, how they account for HL, and which barriers they encounter regarding HL-sensitive communication and creating a HL-sensitive environment in pediatric outpatient care when providing advice on ECAP.

## METHODS

### Study Design

The ethic committee of the University of Regensburg approved this study (18-1205-101). Written consent was obtained from all study participants in accordance with the ethics approval. Participation was voluntary and financial incentives for participation were offered.

We chose an exploratory qualitative study design allowing us to explore meanings of social phenomena as experienced by pediatricians in their natural context in depth (Malterud, 2001) and without envisaging broader representativeness (Mays & Pope, 1995). The approach is flexible and open-minded. Personal experiences and subjective views provide different perspectives that might be missed out on when working with predefined categories and assump-

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tions (Ritchie, 2011). Our study was registered in OSF (<https://osf.io/>) and published as a protocol beforehand (Curbach et al., 2021).

### Theoretical Underpinning

According to the comprehensive HL model of Sørensen et al. (2012), the ability of an individual to find, understand, appraise, and apply health information is put into the context of personal, situational, social, and environmental determinants. This model defines our understanding of HL in this study. Pediatricians are an important source of health information for parents and by providing a HL-sensitive environment may co-determine parental HL. The model, with its core elements of supporting parents in accessing, understanding, appraising, and applying health-related information, served as a basis to develop the interview guide. Subsequently, the categories for analyzing data were derived deductively from the interview guide and inductively from the generated interview data.

### Data Collection

From July 2020 to February 2021, two early-career research fellows with previous qualitative research experience and backgrounds in Comparative European Ethnology (J.v.S., E.-M.S.) conducted semi-structured interviews. The interviews were conducted via telephone, audio-recorded, transcribed verbatim, and pseudonymized. The interview guide consisted of questions regarding (1) ECAP in pediatric consultations, (2) ECAP information acquisition and transfer to parents, and (3) consideration and support of parental HL when providing advice on ECAP (Table A). Information on characteristics of the participants was collected after the interview.

### Recruitment

A purposive sampling strategy was applied to obtain rich information, with a maximum variation of perspectives to ensure rigor (Mays & Pope, 1995; Palinkas et al., 2015). We recruited pediatricians working in outpatient care in Germany, with a focus on reaching a variety regarding the catchment area of the practice (rural/urban), gender, form of practice (shared/single), working experience (less than or more than 15 years) and specialization regarding allergies (Table 1). Pediatricians working solely in a hospital setting were excluded. Initial contact to interview partners was established through “PaedNetz Bayern,” a Bavarian association of pediatricians, and the Professional Organization of Pediatricians Nordrhein.

Written information material was forwarded to potential participants by the chairperson of the respective association. After sending emails with detailed information on the study, further information was provided via telephone and dates for interviews were scheduled. Subsequent snowballing and personal contacts completed our sample. Recruitment was stopped once theoretical saturation was reached. During the collection of the interview data, the research team continuously discussed topics and themes in the data.

After 15 interviews, three researchers (J.v.S., E.-M.S., J.C.) jointly agreed that no more topics had emerged. Four additional interviews were conducted to ensure that data saturation was reached (Saunders et al., 2018).

### Sample

Of the 10 female and 9 male study participants, 9 worked in North-Rhine-Westphalia and 10 in Bavaria. The ages ranged between 39 and 67 years. Eight pediatricians worked in a single practice and 11 in a shared practice. Further characteristics are provided in Table 1.

### Analysis

Data were subjected to content analysis (Kuckartz, 2018). Initially, the interviews (range: 26-103 minutes; mean: 48 minutes) were deductively divided into three main topics following the topic guide to become familiar with the data (Malterud, 1993). For each main topic, four interviews were coded jointly by two researchers (J.v.S., E.-M.S.) using Atlas.ti (Version 8) identifying emerging topics and organizing them into a code scheme. Thereafter, all interviews were coded following this code scheme by two researchers independently (J.v.S., E.-M.S.). After completion, divergent coded passages were discussed until consensus was reached (Fereday & Muir-Cochrane, 2006). By grouping codes into higher levels, overarching themes were identified. These were summarized and enriched with the most significant quotes (Patton, 2009). The study adheres to the COREQ (COConsolidated criteria for REporting Qualitative Research) guideline for reporting qualitative research results (Tong et al., 2007).

### Informed Consent and Confidentiality

Participation in the study was only possible after providing informed consent to the audio recording and scientific use of the interview data. Data storage and handling of personal information followed the data protection policy of the Medical Sociology of the University of Regensburg (Medizinische Soziologie, 2021).

TABLE 1

**Pediatricians Included in Our Study  
(N = 19)**

Sample Category	Pediatricians
Catchment area	
Rural: Village/small town: <20,000 inhabitants	6
Urban: Medium-sized/large town: >20,000	13
Gender	
Male	9
Female	10
Practice	
Single	8
Shared	11
Experience	
≥15 years	9
<15 years	10
Specialization in pediatric allergy	
Yes	6
No	13

**RESULTS**

First, we will present our results focusing on ECAP in pediatric consultations in general. Then, we will take a closer look at ECAP related HL-sensitive advice in pediatric practices to lastly identify barriers in providing HL-sensitive advice on ECAP.

**ECAP in Pediatric Consultations**

*Considering allergy risk.* Most pediatricians considered allergy risk anamnesis during the first consultation essential for all children. They described different strategies to assess the allergy risk (e.g., asking verbally during the examination or handing out a questionnaire beforehand) (Table 2). However, they emphasized that allergy anamnesis poses a challenge during consultations, as parents oftentimes lack understanding of how the term “allergy” is defined. Sometimes it is necessary to explicitly inquire if, for example, hay fever has occurred in the family to correctly determine the child’s allergy risk (Table 2).

Even though the allergy risk was assessed by pediatricians most of the time, the pediatricians also stated that they do not adapt the content of advice regarding ECAP, as recommendations are similar for families with or without a risk of allergy (e.g., early introduction of solid food while breast-feeding, no omission of allergens) (Table 2). Families with children who have risk factors for allergies are advised to adhere to general prevention recommenda-

tions and only sometimes advised more specifically (e.g., regarding skin care) (Table 2).

*ECAP evidence transfer to parents.* All interviewees were well aware of current ECAP recommendations and the shift of evidence from avoidance of allergens to early exposure. It was mostly reported there weren’t difficulties explaining this change in recommendations. They appeared highly confident that parents were able to understand and accept their explanations and assumed that parents trusted their advice (Table 2).

Our interview partners described ECAP as usually not being a stand-alone topic, but as included in recommendations on health behavior in general (Table 2). They did not perceive ECAP and passing on respective information to parents as difficult or controversial.

As ECAP is resonating within basic topics, they described it as rather easy to explain and most interviewees were generally convinced that it was also easy to understand for parents and most recommendations would be easy to apply (Table 2).

The topics considered most important in which ECAP resonates during consultations are nutrition (breast-feeding, choice of formula, introduction of solid food), hygiene, skin care, and the living environment (smoke-free, recommendations regarding pets) (Table 2).

Scientific evidence regarding ECAP was only sometimes described to be directly passed on to parents. A process of filtering and translating information according to parents’ abilities was outlined (Table 2). Some pediatricians recounted to adapt their recommendation according to their own interpretation of current scientific evidence (Table 2).

Referring to the early introduction of peanuts in child nutrition—an example for a very specific and rather radical recommendation—pediatricians were largely aware of current evidence, but reluctant to communicate it explicitly. Only when asked by parents, they would elaborate on this in more detail. Fear of unwanted side effects (e.g., aspiration of a peanut) and cultural inhibitions, as peanuts not being an integral part of most Germans’ nutrition, were reasons to omit these recommendations (Table 2).

*Reassuring parents regarding allergies.* Several interviewees stated that part of providing advice on ECAP is also to reassure insecure or overcautious parents (e.g., who are feeding hypoallergenic infant formula or omitting food without any indication). These pediatricians emphasized the need to calm parents down and put recommendations into perspective (Table 2).

TABLE 2

**Significant Quotes Regarding Pediatricians’ Consultations on Early Childhood Allergy Prevention**

Allergy Risk	Quotes
<i>Considering allergy risk</i>	
Assessing allergy risk	<p>1. When patients come to my practice for the first time, they have to fill in a medical history form. They have to fill in their profession, whether there are siblings, and if there are illnesses within the family - for example, allergies. (Interview 11)</p> <p>2. When they come to my practice, I ask: “Does anyone have allergies?” And if someone says no, I ask specifically if they have asthma, hay fever, or neurodermatitis. For example, if you ask about asthma, they say, ‘yes, he always has such a funny cough.’ You really have to ask specifically. (Interview 12)</p> <p>3. I ask whether the parents are healthy. I need to know that, too. And then I ask if the parents have allergies, and then I ask about the siblings. I ask specifically for hay fever because many don’t see hay fever as an allergy. (Interview 13)</p>
Advising families with children with an allergy risk	<p>4. Even for children at risk, I can’t be 100% sure that an allergy will occur. I can’t avoid it, except through general prevention recommendations. Parents are sometimes very unsettled by all these recommendations. (Interview 17)</p> <p>5. I also recommend to parents whose children already have eczema, the normal introduction of complementary food. (Interview 6)</p> <p>6. We advise that children with a high risk of allergy are not touched with food on the hands. For example, if the mother has just cut an egg, she should not touch the child’s skin. Thus, we avoid contact sensitization via the skin. The same accounts for peanuts – we don’t put peanut products on the inflamed areas of the skin because we have to assume that the child will also be sensitized via the skin. In other words, skin care is an important factor. (Interview 10)</p>
<i>ECAP evidence transfer to parents</i>	
Dealing with the evidence shift	<p>7. ...And, I tell parents: Don’t be surprised, what I’m telling you now is different to what I told you 2 years ago with your older daughter. In the meantime, some things have changed within the guidelines. And, I always explain to them: That’s the way medicine works, and they have no trouble accepting that. The more educated ones always have the feeling that they are in good hands, because I am a doctor who continues my education. (Interview 11)</p> <p>8. And, many parents in the practice trust the pediatrician completely and follow the recommendations. (Interview 14)</p>

**Pediatricians’ Consideration and Support of Parental HL**

**Knowledge of HL concept.** We asked the interviewees if they knew the term “health literacy.” Most pediatricians of our sample stated that they had heard of the term (Table 3). However, in their accounts it became clear that most were not aware of HL as the competence to find, understand, appraise, and apply health information. HL was rather

perceived as another term for knowledge about health and health behavior, which, according to the interviewees, should be provided in school (Table 3). Only pediatricians with a strong background in research had heard about HL as in our understanding (Table 3).

**Assessment of parental HL.** All interviewees considered assessing parents’ information needs during initial appointments important, as well as parents’ current state (e.g., suf-

TABLE 2 (CONTINUED)

**Significant Quotes Regarding Pediatricians' Consultations on Early Childhood Allergy Prevention**

Allergy Risk	Quotes
Integrating ECAP in pediatric consultations	<p>9. That [ECAP] is part of the medical preventive check-ups. It's especially part of consultations on nutrition. (Interview 6)</p> <p>10. In the beginning, the recommendations are generic, and in the medical preventive check-ups, this is only specifically addressed when there is a family history or actually an indication. (Interview 12)</p> <p>11. If there is no family history, I only talk about nutrition and I always suggest a balanced diet, consisting of local products, no tropical fruit, for example. (Interview 13)</p> <p>12. In fact, it's rare that you say: So, today we're going to talk about allergies. It resonates within other topics. (Interview 14)</p> <p>13. I believe that the public recommendations regarding allergy prevention are easy to apply. That's not difficult, I'd say. There are other topics, such as vaccinations, that generate much more controversy. (Interview 9)</p>
Topics considered important for ECAP	<p>14. The most important thing of course is breastfeeding, as it has a preventive factor. And then it's the timing and mode of introduction of complementary food. (Interview 8)</p> <p>15. We also try to pass on to parents the preventive measures recommended by the German Society for Pediatric Allergology. For example, breastfeeding for 4 months, if possible, introduction of fish both during pregnancy and in the complementary diet, and frequent skin care. (Interview 10)</p> <p>16. When it comes to the little ones, if the skin is very dry, we address skin care. Because according to current evidence, it is important that the barrier function is intact. Thus, we recommend that if the skin is dry, it should be creamed more – in the sense of basic therapy and prevention. And that one should not bathe in food (e.g., in milk); this could lead to an oversensitization via the skin. (Interview 15)</p> <p>17. No cats, breastfeeding, yes. Sometimes the skin is already bad, so we directly recommend how to treat the skin, for example, no "Cleopatra bath," no bathing in cow milk. When the babies are 3 months old, shortly before the introduction of food, this is an important issue. As part of the consultations, when we talk about food, we tell them to eat a varied diet and to use allergens as well. A lot of people have concerns with dairy and gluten and meat and fish and eggs. A lot of foods are associated with worry, so some people tend to leave them out. This also accounts for infant nutrition. I had a mother who used a formula that I didn't know because it was supposed to be better in terms of allergen prophylaxis. And then they change quite often, too. We try to explain that it is important to introduce solid food while breastfeeding, one after the other. (Interview 18)</p>

fering sleepless nights or post-natal depression). None of the pediatricians used a formal strategy (e.g., questionnaires) to assess parental HL, but all applied implicit strategies. They described their intuition and experience as most important to judge parental HL and frequently re-

counted that, especially during initial medical check-ups, they usually take their time to get to know parents during a longer conversation (Table 3). The questions parents asked during the first conversations were described as a strong indicator on how well parents are informed, what

TABLE 2 (CONTINUED)

**Significant Quotes Regarding Pediatricians' Consultations on Early Childhood Allergy Prevention**

Allergy Risk	Quotes
Adapting ECAP recommendations	<p>18. I have the studies in the back of my mind, but I don't pass on everything directly to the parents. It's always difficult to evaluate such large studies by yourself. [...] What I recommend is relatively concrete, relatively simple, and easy to implement. (Interview 6)</p> <p>19. I think scientific studies do not convince parents. That's too scientific – a professional association like the German Society for Nutrition or something like that seems to convey more expertise. (Interview 8)</p> <p>20. We don't recommend hypoallergenic formula anymore. I don't think the recommendation to feed hypoallergenic formula will remain much longer. I don't see any advantage in this nutrition. (Interview 5)</p> <p>21. I must confess I don't really counsel on this topic [early introduction of peanut] that often. I don't tell people about it by default. I don't know, I just have a hard time with that. I think it may be a cultural thing. Peanut consumption is not so widespread in our country. It's just my thinking or feeling. (Interview 6)</p> <p>22. I'm very, very restrictive with peanuts. When you talk about peanuts the parents think: "Aha, then we can just give them the nuts from the packages." I'm very strictly against that. They should not do that under any circumstances, because of the risk of aspiration and, thus, I'm not recommending peanuts for infants. (Interview 7)</p>
Reassuring parents regarding allergies	<p>23. The question of allergy is raised to a much higher degree than we see it medically. For example, a child has a small rough spot because the skin is a bit dry, or the mouth is red because it has eaten tomato. And the parents ask: "Is that an allergy?" We are more occupied with saying this is not an allergy. (Interview 1)</p> <p>24. But I think what we see much more often is that children who do not have a medical history and who are not at risk for developing allergies are given a hypoallergenic diet for some reason. And that's when we intervene and say there is not necessarily a reason for it. (Interview 10)</p>

Note. ECAP = early childhood allergy prevention.

knowledge they are lacking and, thus, where the consultation needs to start and how it needs to be adapted, respectively (Table 3). Besides verbal interaction with parents, pediatricians frequently referred to their visual impression (e.g., clothing and parent-child interaction, and parents' education and profession as further indicators of parental HL) (Table 3).

Overall, pediatricians appeared rather confident in correctly assessing information needs and judging parents' ability to understand health information. Some considered this as one of their core skills as a pediatrician (Table 3).

**HL-sensitive consultations.** When asked about ECAP communication strategies, which consider parents' ability

to understand and apply health information, our interview partners deemed the use of easy language and the omission of science language most important. Some stated to adapt their language based on their previous assessment of parents (Table 3), whereas others thought it to be important to use easy language with all parents, regardless of education, profession, or personal impression (Table 3). Most pediatricians were convinced that they were well understood by all parents.

As another strategy to facilitate understanding, pediatricians referred to the use of pictures, pictograms, videos and mimicking to explain conditions more in depth (Table 3). However, this was rarely described for advising on ECAP,

TABLE 3

**Significant Quotes Regarding Pediatricians' Consideration and Support of Parental Health Literacy**

Parental Health Literacy	Quotes
<i>Pediatricians' consideration and support of parental health literacy</i>	
Knowledge of health literacy concept	<p>25. I have heard about health literacy, but I can't tell you exactly what role it plays for me. (Interview 6)</p> <p>26. I think health literacy is self-explanatory? (Interview 8)</p> <p>27. Interviewer: Have you heard about HL? Interview partner: No, not really. Well, I think health literacy in general is not good. Children learn all kinds of things at school, but hardly anything about health topics. (Interview 10)</p> <p>28. Health literacy, I think that's just "Denglish," (mixture of German and English) yes. I already acquired health competence by virtue of my profession. (Interview 17)</p> <p>29. I did research projects together with a colleague. And she has put together a lot of things [regarding HL]. Among other things, a study that dealt with premature babies and how to inform and educate parents competently so that they can deal well with their children. (Interview 18)</p>
<i>Assessment of parental health literacy</i>	
Intuition and experience of pediatricians	<p>30. I believe it is a lot of intuition on my side? The first two preventive medical check-ups are the "tapping conversations." We always ask about the nutritional situation, the family situation, and family illnesses. If someone answers in a very differentiated way, then they have dealt with the topic. If there are parents who tried the 5th formula in 3 weeks, you know that you have to intervene a bit more. You can see that they are rather uncertain, and that there might be problems. I think you get a feeling for it with daily routine. (Interview 5)</p> <p>31. We usually know the families quite well. It starts with the first contact, which usually takes an hour. That's when you get to know each other and learn about the need for information. (Interview 10)</p> <p>32. It's the complete picture. It's the conversation, the care for the child. Is it adequately dressed, adequately taken care of? It's a comprehensive picture. Also the interaction of the parents with the child and with each other. You can gain a lot of insights out of that. I think that is actually one of the main competences as pediatricians that we have gained the experience to have a good understanding of our patients. (Interview 13)</p>
Question-asking behavior of parents	<p>33. You also get a feeling from the questions that parents ask. For example, questions about things that are obvious for most and you don't even consider to counsel on. (Interview 14)</p>
Education and profession of parents	<p>34. To be honest, if the father is a physicist and the mother an electrical engineer, I talk to them differently than if both parents are unemployed. (Interview 2)</p>

but rather when explaining physical conditions, like the occurrence of an asthma attack, or interventions like the use of asthma spray.

To ensure that the information provided was understood, most interviewees asked the parents at the end of the consultation if they still had any questions; this was a common strat-



TABLE 3 (CONTINUED)

**Significant Quotes Regarding Pediatricians' Consideration and Support of Parental Health Literacy**

Parental Health Literacy	Quotes
<i>Health literacy sensitive consultations</i>	
Adapting the language	<p>35. I try to adapt the language, of course. If I know that there is a colleague or an academic sitting in front of me, naturally, I speak differently. I notice from the way people talk how I have to talk to them. (Interview 1)</p> <p>36. It doesn't matter whether it's a professor's wife, a colleague, or a person who works in the municipal building yard here, I try to speak clearly, I don't use any foreign words. Since I left the clinic, I strictly made a habit of not using medical terms with patients anymore. (Interview 7)</p>
Demonstrating explanations	<p>37. The best way to explain things is demonstrating or imitating, for example, how a child sounds with asthma. (Interview 4)</p>
Fostering question-asking behavior	<p>38. I'll ask them: Did you understand that, or do you have any questions? Is there anything else you would like to know? Now, I have talked so much, is there anything still unclear to you? (Interview 18)</p> <p>39. I just ask: did you understand everything, are there any questions? And, then I see them quite frequently and I can observe if there was something not clearly understood – especially in the beginning. (Interview 13)</p>
Using Teach Back	<p>40. I always try to have parents sum up in their own words what I told them. I ask them to summarize what they understood and what they should pay attention to. This repetition by the parents is the best way to know if they understood. (Interview 14)</p>
Summarizing the most important messages in the end	<p>41. I summarize it again and you can already tell by the facial expressions, oh, someone didn't really understand. Then I try to summarize it again in other words. And, most of the time it works. (Interview 17)</p>
<i>Health literacy sensitive environment</i>	
Providing written information	<p>42. The problem is that parents have too much written information already. We give them so much paper anyway. (Interview 15)</p> <p>43. We have a final sheet with all the take-home messages, and we go through all of them again one by one. At the end I ask again, a second time, if there are any further questions. (Interview 2)</p>
Other providers of information within the practice	<p>44. Many call and say: "Can I speak to Mrs. X?" That's the pediatric nurse. And, then they ask: "Can I feed the child salmon at 8 months?" And, then she gives advice. For some, she seems to be easier to approach. (Interview 11)</p>
Offering additional advice	<p>45. I tell them to go home and talk about it with their husband and if they have additional questions, they can call or write an email. (Interview 18)</p>

Note. HL = health literacy.

egy (Table 3). The interviewees were convinced that parents do feel free to ask questions and have no inhibitions. It was

sometimes recounted that it is possible to observe if information was understood or not, due to the frequent contact

TABLE 4

**Significant Quotes Regarding Barriers in Providing Health Literacy Sensitive Advice on Early Childhood Allergy Prevention**

Health Literacy Advice	Quotes
<i>Barriers in providing health literacy advise on ECAP</i>	
Timing of providing advice on ECAP	<p>46. We actually need to address ECAP during every appointment, because the child matures and there are new requirements and questions for the families. We would actually need a medical preventive check-up before birth to really address ECAP thoroughly. (Interview 3)</p> <p>47. Few people know, for example, that children have an increased risk of allergies if one or both parents also have atopic diseases. Actually, the gynecologist should start advising on ECAP. (Interview 5)</p> <p>48. Unfortunately, the issue of breastfeeding is (at 3-6 weeks) actually already decided. The gynecologists or midwives would actually have taken a positive influence. (Interview 16)</p>
Cooperation with midwives	<p>49. They [midwives] have incredible importance and power, during a very formative period, where the midwives visit the parents at home. That's why it's important that midwives and pediatricians coordinate their work. (Interview 15)</p> <p>50. But there are still midwives who still cling to this old scheme - 6, 7 months of exclusive breastfeeding. You have to argue against that again and again. And in case of doubt, the midwife is always more competent in the eyes of the parents. (Interview 8)</p>
Time and amount of topics	<p>51. We are supposed to provide so much information, during the medical preventive check-ups. I talk like a machine gun and sometimes I realize that nothing gets through to the parents - accident prevention, secure attachment, mental health, vaccinations. That takes up so much time. I have to be honest: I'm not additionally talking about peanut butter. (Interview 7)</p> <p>52. Yes, 17 minutes is foreseen for a preventive medical check-up. So, theoretically, you could start a medical preventive check-up every 17 minutes. That's in theory though. In our practice, we actually take at least 40 minutes. (Interview 5)</p> <p>53. There is good information from the Federal Center for Health Education, but to be honest, when I have explained something to the parents, I don't insistently ask again: "Now tell me what I have been explaining to you for the last five minutes." Of course, I could ask parents to repeat my explanations, but my day would need 48 hours. I don't know if you are aware of how we actually work, but I have to talk about all the topics and I also have to think economically. I only have a limited budget of time. (Interview 7)</p>

Note. ECAP = early childhood allergy prevention.

with the families during the first year of life (e.g., if parents adhered to recommendations or not) (Table 3). Only one pediatrician reported to apply Teach Back and have parents sum up what was explained in their own words to ensure understanding (Table 3). Others summarized the most im-

portant messages of their consultation in the end themselves (Table 3).

**HL-sensitive environment.** Handing out written information was regarded as mostly helpful. This would allow parents to go more into depth on certain topics at home when they

had more time and were less distracted. However, written information specifically on ECAP was only rarely passed on, as the pediatricians had the impression parents were overwhelmed by written information (Table 3). Writing down individual take-home messages was considered helpful (e.g., how to take the medication) (Table 3).

Furthermore, some pediatricians mentioned the importance of other personnel within the practice setting (e.g., physician assistants or pediatric nurses). Not only were they described as contributing to reduce the time needed for consultations and to answer parents' questions beforehand, but they were also sometimes considered an information resource that parents could contact more easily (Table 3).

Additionally, some interview partners stated to offer the possibility to ask further questions via telephone or email after the consultation within the practice, which was described as being readily accepted by parents (Table 3).

## **BARRIERS IN PROVIDING HL-SENSITIVE ADVICE ON ECAP**

### **Timing of Providing Advice on ECAP**

First contact with the family pediatrician usually takes place when the child is between the ages 3 and 8 weeks old. Pediatricians in our sample consented that this was too late for providing advice on ECAP adequately, since parents decide for or against breastfeeding right after birth. Hence, they favored a preventive medical check-up before delivery to advise on ECAP in a more timely and suitable moment (Table 4). Some pediatricians suggested the provision of ECAP information by obstetricians and midwives, as they are providing health information during pregnancy and can therefore lay the foundation for comprehensive ECAP (Table 4).

### **Cooperation with Midwives**

The crucial role of midwives for providing adequate advice on ECAP was mentioned in some interviews, as those are closely connected to the families and oftentimes attend them before, during, and after birth. Thus, a strong relationship of trust can be developed and recommendations by midwives might be adhered to more strongly.

Therefore, the need to align consultations by midwives more strongly with pediatric consultations was emphasized as there are sometimes discrepancies regarding recommendations on feeding (e.g., some midwives would still recommend 6 or 7 months of exclusive breastfeeding, whereas an earlier introduction of solid food is recommended in current guidelines) (Table 4).

### **Time and Amount of Topics**

Time constraints constitute a major barrier regarding HL-sensitive provision of advice on ECAP according to the interviewees. Health topics to be covered during the first appointments are numerous and parents are oftentimes distracted by the (crying) baby and thus not able to take up all the information provided within the time foreseen. Applying HL-sensitive communication strategies like Teach Back to ensure understanding was perceived as too time-consuming. Additionally, interview partners emphasized a lack of financial compensation regarding intensive consultations and some stated that integrating HL-sensitive communication techniques and providing more comprehensive ECAP information would overburden them (Table 3).

## **DISCUSSION**

In our study, all pediatricians deemed ECAP a relevant topic for families of infants. While allergic risks are normally assessed during initial encounters, ECAP is addressed only implicitly as part of general advice on nutrition, hygiene, and smoking. Morniroli et al. (2021) concluded that mothers need a thorough knowledge on prevention topics, as otherwise benefits of breastfeeding and vaccines may be underestimated. This may be the case for ECAP as well, because parents may underestimate the potential of prevention of advice on ECAP when it only resonates in other areas such as nutrition, hygiene, and living environment.

Even though there was a shift of ECAP evidence, pediatricians of our sample described it as an easy to explain topic. In their everyday practice they sometimes refer to scientific evidence to underline changes in recommendations, but mostly they filter and adapt information to the parents' needs. The provision of scientific information to parents can enhance adherence (Buffarini et al., 2020; Griffeth et al., 2022); thus, it is necessary to consider to what extent information is filtered and adapted to ensure parents are provided with adequate information.

In line with Chang et al. (2021), who conducted a qualitative study on early peanut introduction and testing in the United States, we also observed that specific recommendations were rather reluctantly passed on by pediatricians. However, in our study, lack of pediatricians' awareness was not a barrier, as the recommendation of introducing peanut early was well known, but rather fear of "side effects" was mentioned as inhibiting factor (e.g., the aspiration of peanuts) (Alvarez et al., 2020; Chang et al., 2021).

Pediatricians are an important source of health-related information for families. They have the possibility to provide access to information and help parents understand, appraise,

and apply health information. However, like in other studies, our interview partners were mostly unaware of HL as a concept and the responses regarding the meaning of HL differed (Gillis et al., 2013; Lambert et al., 2014). Nevertheless, our interviewees did consider it important to somehow assess how parents handle health information. HL assessment tools were not applied, which is in line with the findings of a study on HL perceptions and knowledge in pediatric continuity practices (Griffeth et al., 2022) as well as a study on nursing and allied health professionals (Brooks et al., 2020). However, parental HL was assessed based on intuition and experience by considering parental education and profession, questions asked by parents, language used and parent-child interaction. It is common to assess people based on their appearance, as was frequently mentioned in the interviews, and was described similarly in another qualitative study with nursing and allied health professionals (Brooks et al., 2020). However, for health professionals and regarding HL, everyday life preconceptions should not be the guiding principle to estimate patients' information needs, as patients' HL can easily be overestimated or underestimated. Even though some researchers recommend formal HL screening (Davis et al., 2013; Hadden & Kripalani, 2019), there are also some studies that indicate that formal HL screening is not always considered advisable; the potential harm from shame and alienation may outweigh benefits (Bitzer, 2017; Kronzer, 2016; Paasche-Orlow & Wolf, 2008). In turn, however, patients can be overestimated in how well they understand health information (Dickens et al., 2013; Griffeth et al., 2022; Storms et al., 2019; Voigt-Barbarowicz & Brütt, 2020). This may be particularly disadvantageous regarding preventive topics like ECAP, as they are considered easy to understand and to apply and parents' comprehension of information might thus be overestimated.

Therefore, the universal precaution approach could substitute explicit HL screening, meaning that all patients are treated as if of low HL (DeWalt et al., 2011; Griffeth et al., 2022).

In our study, pediatricians regarded the use of simple language as the most important in HL-sensitive communication. However, in practice some speak plainly with all patients, whereas others adapted their language according to how they perceived a parent's HL. This is the perspective of the interviewees on their professional practice, and it remains unclear what is actually perceived by the patients. The use of simple language and avoidance of medical jargon may be overestimated, as was shown in a study on physicians' use of clear verbal communication (Howard et al., 2013). Our findings are similar to the findings of Griffeth et al. (2022) on HL perceptions and knowledge in pediatric continuity practices.

In a mixed-methods survey, they could show that participants were convinced they could identify patients with low HL; only some (19% of the residents and 26% of faculty) were familiar with universal HL precautions and many received no HL training. Different to our results their participants could correctly identify the definition of HL.

Similarly, pediatricians of our sample perceived time constraints as a major barrier in providing advice HL-sensitively, which is also in line with a review by Rajah et al. (2018) on provider and patients' HL perspectives (Griffeth et al., 2022). Teach Back, although found an effective method (Talevski et al., 2020), was only applied by one of our interviewees due to time-constraints and lack of knowledge on how to apply Teach Back sensitively. This is in line with the findings of a mixed-methods study on limited health literacy. This study showed that physiotherapists agreed on the importance of communication techniques like Teach Back; however, this technique was only infrequently applied (Teach Back in 2% of consultations) (van der Scheer-Horst et al., 2023). However, Teach Back may actually save time in the long-term, as patients have fewer follow-up questions and are better prepared for appointments (Anderson et al., 2020). Family and internal medicine residents in the United States highly overestimated their application of Teach Back as they lacked knowledge on how to actually put this into practice. A 1-hour skills training increased their use of Teach Back significantly (Feinberg et al., 2019). It may be worth considering such training for pediatricians as well.

### **Practical Implications**

The importance of considering HL in consultations on prevention should be more strongly emphasized in medical education and training. This might reduce health care professionals' reluctance to implement helpful techniques. The advantages of HL-sensitive communication (e.g., saving time in the long-term) should be emphasized to encourage its application with all patients. A closer alignment with midwives' consultations and maybe even earlier contact between pediatricians and parents (e.g., before the child is born) seems relevant, not only to cover topics like ECAP early, but also to foster parents' HL by providing evidence-based recommendations on certain topics such as high-quality websites on infant nutrition.

### **STRENGTHS AND LIMITATIONS**

To our knowledge, this is the first study with ECAP as a use case for HL-sensitive consultations by pediatricians. The sample entailed a great variety of pediatricians, in terms of practices (rural vs. urban; individual vs. shared), age, and

experience, and could capture distinct perspectives. This allowed for detailed insights into pediatricians' perceptions of their daily working life and their approach to providing advice on ECAP. However, a limitation of this study is that it is based solely on interview data from pediatricians and their own experiences and practices. We did not observe pediatricians' practice nor did we triangulate the data (e.g., with their patients' perception) and can thus make no assumption about the actual effects and effectiveness of the pediatricians communication behavior.

Originally, we had planned to collect the data via face-to-face interviews to perceive the context more closely (e.g., practice environment, interview situation, facial expressions and gestures) (Curbach et al., 2021). However, switching to telephone interviews, given the COVID-19 pandemic-related restrictions, offered more flexibility, as the interviews were conducted whenever convenient for the pediatricians. Subsequently, the interview situation was often relaxed and friendly, which was explicitly expressed by the interviewees oftentimes directly after the interviews.

Lastly, pediatricians with a special interest in ECAP or HL might have been more interested in study participation; therefore, the interviewees were possibly better informed on ECAP or had greater awareness of HL.

## CONCLUSION

ECAP recommendations are well-known by pediatricians and considered easy to counsel on. However, ECAP is only seldomly addressed specifically, but rather in connection with recommendations on nutrition, hygiene, living environment and skin care. Even though all pediatricians of our sample considered it important to account for parents' information needs and abilities to understand, appraise, and apply health information, there is no systematic assessment of parental HL and the universal approach of treating all patients as if low HL is not always applied. It seems warranted to enhance professional education and training for pediatricians in HL and HL-sensitive communication to reach all parents with HL-sensitive advice on ECAP.

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## **Table A**

### **Interview Guide**

*The interviews started with questions on COVID-19, as the pandemic was very much in focus at the time of the interviews. These were analyzed separately (von Sommoggy et al.: Pediatricians' Experiences of Managing Outpatient Care and Patient Counselling during the COVID-19 Pandemic: A Qualitative Study in Germany. Submitted.)*

### **Introduction – Early Childhood Allergy Prevention (ECAP)**

1. Does ECAP play a role in your consultations?
  - a. When do you address it?
  - b. With which patients/ on what occasions?
  - c. How do you advise families with children at risk of allergies?
  - d. What is the most important message you pass on to parents regarding ECAP? What other topics play a role in regard to ECAP (e.g., nutrition, living environment, allergen exposure...)?

### **Information acquisition and transfer to parents**

1. How do you inform yourself about medical topics (especially allergy prevention)?
  - a. Specifically, what sources do you use (list them)? (Professional articles, reviews, guidelines, journals, online, expert conferences, workshops, colleagues).
2. Are you satisfied with your information options? Do you feel well informed?  
Why yes/not?
  - a. Why do you feel (not so) well informed by, for example, guidelines/reviews?
  - b. Is there anything else you would like to have in order to stay updated?
3. How do you deal with conflicting and changing information?
4. We just talked about how you keep up to date on medical recommendations: What do you do with the knowledge, e.g., from studies or continuing education (in your head), to use it in your practice? (e.g., discussing with specialists/colleagues).
2. How do you incorporate this knowledge into your daily work?
3. When you think of studies, professional information, scientific recommendations, etc.: are there aspects that make it difficult to "pass on" or translate the information?
4. Apart from the positive and negative aspects of knowledge transfer: is there anything that could be improved in order to facilitate the medical counselling of parents?

### **HL-sensitive consultations**

1. How do you deal with different patients (level of knowledge, education, migration background) when it comes to consultations and knowledge transfer? Do you make any differences? Can you give an example?
2. How do you find out (for yourself) what level of knowledge and information needs parents have?



- a. How do you notice in which cases you have to explain a lot or in a way that is easy to understand?
3. Do you use strategies to assess which information and support needs parents have?
  - a. If yes, which ones? (e.g., questionnaires/screening tools, specific questions during initial contact, inquire about level of education etc.)
4. What prior knowledge or lay ideas about ECAP do parents bring to consultations? (Fears, myths, personal experiences, Google, social media etc.).
5. Do you think parents are well informed regarding allergy prevention?
  - a. How can you tell?
6. Where do you see opportunities to help parents find information and make decisions?
  - a. Can you give examples from your daily work?
7. Do you provide anything for your patients to educate themselves regarding certain topics (e.g., allergy prevention)?
  - a. What do you think is particularly helpful here and what is not? (If there is something, ask if that could be sent to the interviewer; reference to practice website, etc.).
8. Do you use any strategies during the conversation to make sure the parents understood everything? (Using simple language, avoiding technical language, drawing pictures, etc.).
9. Do you do anything to ensure that parents implement your health behavior recommendations?
10. How well do you think you are trained and educated to advise your patients according to their needs?
11. Do you see a need for information/continuing education for yourself on how you, as a pediatrician, can communicate health knowledge to parents in a more understandable way?
12. How would scientific results/recommendations have to be prepared to be well usable for practice or in consultation?
13. Have you heard about "health literacy" in your work or education?
14. I have now addressed all the topics I had in mind. Are there any other important points from your side that you have not been able to mention so far?