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Disease perception of children with cystic fibrosis and the impact of the disease on their lives: A picture-analysis study

Selin Söyünmez [a,*], Yağmur Sezer Efe [b], Mehmet Köse [c]

[a] Kırşehir Ahi Evran University Faculty of Health Sciences, Department of Nursing, Kırşehir, Türkiye
[b] Department of Nursing, Faculty of Health Sciences, Erciyes University, Kayseri, Türkiye
[c] Department of Pediatrics, Faculty of Medicine, Erciyes University, Kayseri, Türkiye

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ABSTRACT

Background: Cystic fibrosis affects children physically, psychologically, and socially. However, children may have difficulty verbally expressing their feelings and thoughts about the disease. The aim of this study was to explore how children with cystic fibrosis perceive the disease and how it impacts their lives using the picture analysis method.
Methods: A qualitative design was used in this study. Children were asked to draw pictures illustrating how they perceive their illness. The story behind each drawing and the results obtained from the picture analysis were converted into written texts and examined together. The obtained written texts were transferred to the MAXQDA 2020 software for coding. A thematic analysis was conducted, and themes and subthemes were created.
Results: In this study, most of the children were male, aged 8 to 12 years, and had been diagnosed within the first six months of life. All participants had a history of hospitalization and were undergoing ongoing polypharmacy. The drawings created by the participants reflect various emotions, thoughts, experiences, and desires related to the disease. Analysis of these drawings identified three main themes (Perception of Disease, Impact of Disease and Treatment Process, Needs and Desires) and 10 subthemes.
Conclusions: The drawings created by participants illustrate both positive and negative perceptions of the disease, as well as issues related to socialization, body image, self-esteem, and psychosocial well-being.

Introduction

Cystic fibrosis (CF) is a life-threatening genetic exocrine gland disorder diagnosed in the neonatal period, primarily affecting the respiratory and gastrointestinal systems (Conk et al., 2013; Fırıncı et al., 2012). The complexity of CF diagnosis and treatment, alongside its impact on symptoms and lifestyle, leads to psychosocial challenges. The International Cystic Fibrosis Mental Health Committee reports high rates of depression and anxiety among individuals with CF. These psychological symptoms, in both patients and their parents, are linked to reduced lung function, low body mass index, poor treatment adherence, decreased quality of life, frequent hospitalizations, and increased healthcare costs (Quittner et al., 2016). Research shows that 80 % of children with CF aged 8–11 and 50 % of those aged 12–17 have at least one psychiatric disorder, with anxiety affecting 46.8 % of children with CF (Gundogdu et al., 2019). A systematic review confirmed anxiety as the most common mental health issue in children with CF, with a higher prevalence than in the general pediatric population (Kimball et al., 2021). Children with CF face physical, behavioral, and emotional risks and require specialized care (Santana et al., 2020).

Families serve as the primary caregivers in managing self-care for children with CF (Rego et al., 2024). Since these children depend on adults for continuous care, their self-care skills development may be impaired (Isik et al., 2021). The life-limiting nature of CF can cause parents to perceive their children as fragile, which may lead the children to feel inadequate in managing their illness and hinder self-development (Ernst et al., 2010). Additionally, increased healthcare needs may foster negative perceptions of illness and treatment in children (Santana et al., 2020). School-aged children with CF often hold negative attitudes toward their illness, which obstruct self-care skill acquisition (Rego et al., 2024). CF can also adversely affect socialization in children.

Parents of children with CF may limit their children's social activities with peers due to the risk of infection (Branch-Smith et al., 2018), while frequent hospitalizations may increase school absences and decrease peer interaction (Coyne, 2008; Lynn et al., 2023). Decreased socialization in children with CF has been reported to be associated with an increase in mental health problems (Anton-Paduraru et al., 2015; Helms et al., 2017;

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* Corresponding author at: Kırşehir Ahi Evran University Faculty of Health Sciences, Department of Nursing, Kırşehir/Türkiye.
E-mail addresses: selinsoyunmez@gmail.com (S. Söyünmez), ysezerefe@erciyes.edu.tr (Y.S. Efe), dr.mkose@erciyes.edu.tr (M. Köse).

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Quittner et al., 2016). Especially after starting school, children with CF begin to perceive themselves as different from their peers (Pizzignacco & Lima, 2006). Over time, children with CF may perceive themselves as different from their siblings and peers (Li et al., 2023). It has been reported that children with CF feel different due to their illness and are subjected to teasing and bullying by their peers (Fairweather & Jones, 2022). The treatment process, including enzyme use, and physical changes such as low weight and clubbing, may also lead children to perceive themselves as different from their peers (Prieur et al., 2021).

Children may not be able to express their feelings and thoughts as adults do. When children are unable to express their feelings and thoughts with words, one of the methods used to understand them is picture analysis (Yavuzer, 2016). Drawing is a bridge through which the child expresses their pure feelings and thoughts, as a product of both the conscious and subconscious (Halmatov, 2020; Halmatov, 2023; Lebedeva, 2022). The developmental theorist Piaget also defined children's drawings as the outward expression of the mental image and its reflection on paper (Ölçer, 2019). The analysis of children's drawings is a method that provides insight into the child's personality, inner world, emotions, thoughts, dreams, desires, environment, and family processes (Çiçekler & Koruklu, 2013; Halmatov, 2020). It is fun, inexpensive (Çiçekler & Koruklu, 2013), easy to apply, and liked by children (Yavuzer, 2016). Drawing is an easy way of communication, especially for children who do not express their feelings and thoughts, who have difficulty articulating themselves, and who are introverted and shy (Kayacan Keser and Eren, 2015). Thus, children can express themselves effectively through drawing (Kayacan Keser and Eren, 2015).

In the field of health, image analysis method has been used on topics such as pain, experiences related to hospitalization (Erdoğan et al., 2020; Kortesluoma et al., 2008; Tiryaki et al., 2021), nurse perception (Çakırer Çalbayram et al., 2018), asthma (Gabriels et al., 2000), cancer (Rollins, 2005), epilepsy (Carrizosa-Moog et al., 2020; Gomes-Correia, 2000; Hamama & Alshech, 2020; Stafstrom, 2019), abuse (Katz & Hershkowitz, 2010), and immigrant children (Sezer Efe et al., 2023).

While there are studies on the psychosocial challenges faced by children with CF (Gundogdu et al., 2019; Kimball et al., 2021; Quittner et al., 2016), there is a gap in the literature regarding their perceptions of the illness and how it impacts their lives.

Projective techniques, such as drawing, are unique and developmentally appropriate approaches to accessing the subconscious that children may have difficulty expressing or are unaware of. School-aged children, especially those between the ages of 6 and 12, are at a crucial stage of psychosocial development when they begin to develop self-concept (Martens & Badger, 2024; Parker et al., 2015).

Understanding how healthcare professionals perceive and internally evaluate their illness for children with chronic diseases like CF can contribute to the development of psychosocial support strategies. This study aims to explore the illness perceptions of children with CF through their own drawings and to present an original and child-centered perspective that explores the drawing method, which provides an opportunity to understand the children's world.

Research Questions were as follows:

1. How do children with cystic fibrosis perceive their disease?
2. How does CF effect the lives of children?

Methods

This study, which evaluated the disease perception of children with CF and the impact of the disease on their lives through picture analysis, used phenomenology, a qualitative research design. This study was conducted and reported in accordance with the child-centred research checklist developed to improve the design and reporting of pediatric studies (Foster et al., 2025), as recommended by the EQUATOR Network. Children and parents were informed that both parental consent and child assent were required. After the explanation, parents and children were given ample time to assess their participation and ask questions. All explanations were explained using everyday language rather than technical terms, tailored to the children's developmental level and the parents' needs. Children were reassured that there were no wrong answers and that they could speak freely (Foster et al., 2025).

Ethics

Parents and children were provided with both verbal and written information about the study. The study was conducted in accordance with the principles of the Declaration of Helsinki, and ethical approval was obtained from the Clinical Research Ethics Committee of a university (Approval number: 2023/607).

Participants

The population of the study consisted of children diagnosed with CF between the ages of 8 and 12, and the sample was composed of 10 children selected using the snowball sampling method. The inclusion criteria for the study sample were as follows: being diagnosed with CF, being between the ages of 8 and 12, not having any mental or physical disabilities, speaking Turkish, and being willing to participate in the study.

Data collection tools

The "Child and Family Identification Form" was used as the data collection tool in the study.

Child and Family Identification Form: This form consists of 12 questions related to the child's age, gender, time of diagnosis, medication use, hospitalization experience, as well as the mother's age, education level, employment status, family structure, number of children in the family, and the duration of the mother's caregiving.

Data collection

The data for the study were collected online between October 13, 2023, and November 5, 2023. The researchers shared an invitation letter containing information about the study in a family support group on WhatsApp, created by families of children with CF. Before sharing the invitation letter with the families, permission was obtained from the group administrator. Parents and their children who responded positively to the post were contacted individually and provided with information about the study. Informed consent was obtained from 10 children and their parents who agreed to participate in the study voluntarily.

The "Child and Family Identification Form" was distributed to mothers via Google Forms, and they were requested to complete it. Children were provided the opportunity to draw pictures at scheduled times that accommodated their availability. The picture instructions were communicated verbally to both the children and their mothers.

The drawing guideline was developed by all research team specializing in children's health, and expert feedback was obtained from a clinical psychologist. Researcher SS completed 18 h of training in "Child Picture Analysis and Psychological Testing" (including 14 h of theory and 4 h of practice) and an additional 16 h of training in "Child Picture Analysis". The researcher who interacted with the participants was not previously known to them, minimizing potential bias. Participants connected individually online, and data collection took place in their homes, ensuring a comfortable and familiar environment. Children were provided with A4-sized paper and colored pencils to create drawings reflecting their perceptions of CF and its effects on their lives.

According to the drawing instructions, the first researcher (SS) provided the following instructions and asked the child to draw a picture: "*I want you to recall the organs in our body. Some of our organs can be seen from the outside. For example, we can see the nose, hands, and legs when looking from the outside. There are also organs that cannot be seen from the outside, but they are inside the body. Let's recall our internal organs together. For example, the brain, heart, lungs, stomach, kidneys, and* *intestines. Now, I would like you to draw a picture. In this picture, I want you to draw yourself and your internal organs. While drawing your internal organs, I would like you to depict their feelings. You may use any colors you wish for the picture and draw it however you like. We will not be evaluating your drawing skills for this picture. Therefore, do not worry about making it perfect. You can draw it however you want."*

After the child finished drawing the picture, a photograph of the drawing was sent to the researcher, who then asked the child to describe the picture. After the child told the story of the picture, the researcher asked the child the following three questions about the picture, and the child's answers were recorded: *"1. What are your internal organs feeling in the picture?", "2. If the internal organs could talk to you, what would they say?", "3. What changes would the internal organs want to see?"*

Data analysis

In the analysis of children's drawings, color analysis is used to assess a child's emotional state. For instance, black and red in a drawing are associated with depression, hopelessness, or feelings of limitation. Red represents anger; blues and greens represent calmness; yellows and oranges represent joy, while very light and pale colors suggest that the child may be attempting to conceal their true experiences and emotions (Halmatov, 2020; Yavuzer, 2016).

In the study, the analysis of the drawings was carried out in accordance with the interpretation standards of the Draw-a-Person Test (Machover, 1949; Maloney & Glasser, 1982; Taylor, 1953). The primary analysis was conducted by the researcher (SS), who holds a Certificate in Child Drawing Analysis. Each drawing was examined alongside the child's verbal statements, and interpretations were documented.

The children's drawings and the interpretations derived from the analysis of the drawings were sent to a clinical psychologist specializing in child drawing analysis, and expert feedback was obtained. The clinical psychologist's and researcher's comments were found to be consistent. The clinical psychologist had no objections, only a few additions, which were reviewed and integrated into the analysis.

Next, all data were imported into MAXQDA 2020 software for coding process. Two researchers (SS and YSE) independently created and compared codes to ensure consistency (Creswell & Creswell, 2017). Recurring themes were identified through the children's drawings and their narrative descriptions. Following this, all researchers (SS, YSE, MK) reviewed the codes and conducted thematic analysis using Braun and Clarke's six-phase method (Braun & Clarke, 2006). Consensus was reached on the final themes and subthemes.

After the themes and subthemes were created, expert opinions were obtained from three specialists in the field of pediatric nursing and child development. In cases where expert opinions differed, the research team discussed these discrepancies to reach consensus. In cases where consensus could not be reached, the perspectives of the clinical psychologist and researcher S.S. were prioritized because of their expertise in image analysis.

Results

In this study, the majority of the children were male, 11 years old, and had been diagnosed between 0 and 6 months of age. All children participating in the study had a history of hospitalization and were undergoing ongoing polypharmacy. One of the children received triple modulator treatment (Elexacaftor/tezacaftor/ivacaftor), one received single modulator treatment (Ivacaftor), and the remaining children did not receive modulator treatment (Table 1).

The drawings created by the children were analyzed, resulting in the identification of three main themes: "Perception of Disease", "Affected by Disease and Treatment Process", and "Needs and Desires". Additionally, 10 subthemes were identified: Positive Expressions, Negative Expressions, Expectations Regarding Health Condition and Organs, Decrease in Socialization, Psychosocial Problems, Low Self-Esteem, Dependency on Care, Negative Body Image, Desire to Communicate, and Desire for Understanding, Love, and Attention (Table 2).

Theme 1: Perception of Disease

The meaning that children with CF attribute to their disease, as reflected in their drawings and verbal expressions about the drawings, was evaluated by creating the subthemes: Positive Expressions,' Negative Expressions,' and Expectations Regarding Health Condition and Organs.

Subtheme: Positive Expressions

This subtheme includes positive statements from children regarding their illness and organs. Some children expressed that their organs felt good, energetic, and happy: "*My organs feel good. I wouldn't want anything to change." (Participant 5).*

"My organs are happy. I wish my lungs weren't sick so often, but still, my lungs are happy." (Participant 6).

Subtheme: Negative Expressions

This subtheme presents children's negative expressions regarding their illness and organs. Some children reported that their organs felt sad, unhappy, confused, and angry: *"My heart is sad, my brain is sad, and my lungs are sad." (Participant 1).*

"Bone is upset because it has osteoporosis. Bowel is a bit confused, and it usually hurts, which is why it is upset." (Participant 4).

Subtheme: Expectations Regarding Health Condition and Organs.

Children's expectations regarding their organs were explored in this subtheme. Some children expressed a desire for their organs to be healthy and not to use medication, while others stated that they were satisfied with their organs: *"I would like my lungs to function better and not cause me any difficulties. I would like to be healthier, for example, not to get tired so quickly when running." (Participant 4).*

"I would like for the cystic fibrosis to go away and live a life without medication. I would like to eat food and sweets without medication." *(Participant 8).*

Theme 2: Affected by Disease and Treatment Process

The reflection of the effects of the disease and treatment process on children in their drawings was evaluated by creating the subthemes of

Table 1
Sociodemographic Characteristics.

Picture Number	Child's Gender	Child's Age	Diagnosis Age (months/days)	No. of regularly used medications	CFTR Modulators	Previous Hospitalization	No. of Children in Family	Average Time Spent with Child per Day (Hours)	Caregiver Other Than Mother
1	Female	11	18 days	6	Ivacaftor	Yes	3	2	None
2	Male	11	2 months	2	None	Yes	2	1	None
3	Male	12	2.5 months	5	None	Yes	3	6	None
4	Male	11	2 months	6	None	Yes	2	4	None
5	Male	11	3 months	4	None	Yes	2	24	None
6	Female	11	6 months	3	None	Yes	3	24	None
7	Male	8	4 months	4.	None	Yes	2	8	Father
8	Male	12	1 month	7	None	Yes	2	3	None
9	Male	11	2 months	5	None	Yes	2	24	Father
10	Male	8	6 months	3	Elexacaftor/tezacaftor/ivacaftor	Yes	1	8	None

Table 2
Themes and Subthemes.

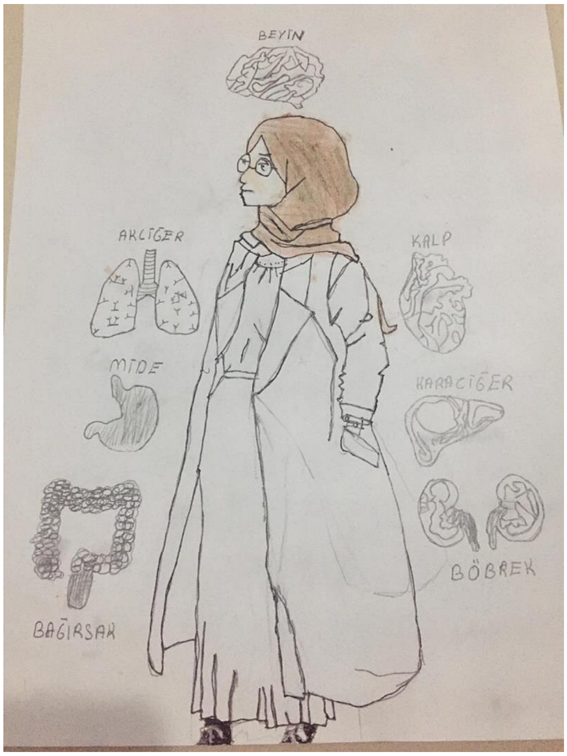
Themes	Subthemes
1. Perception of Disease	1.1. Positive Expressions 1.2. Negative Expressions 1.3. Expectations Regarding Health Condition and Organs
2. Affected by Disease and Treatment Process	2.1. Decrease in Socialization 2.2. Psychosocial Problems 2.3. Low Self-Esteem 2.4. Dependency on Care 2.5. Negative Body Image
3. Needs and Desires	3.1. Desire to Communicate 3.2. Desire for Understanding, Love, and Attention

“Decrease in Socialization,” “Psychosocial Issues,” “Low Self-Esteem,” “Dependency on Care,” and “Negative Body Image.”

Subtheme: Decrease in Socialization

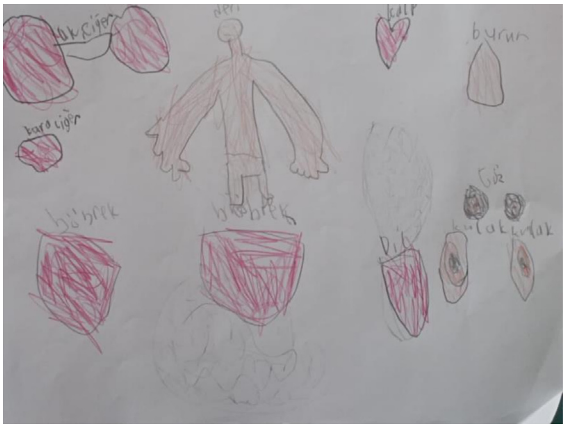
In this subtheme, some children reflected communication problems, exposure to peer bullying, and indifference toward their environment in their drawings.

Picture no:1.



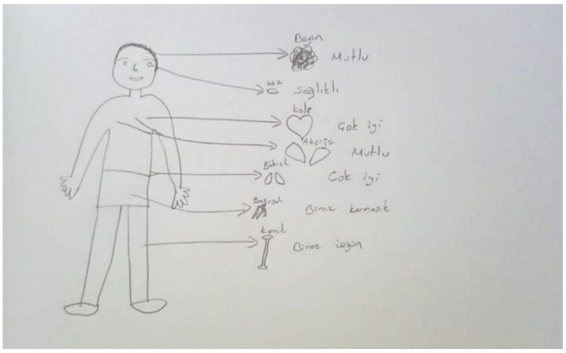
The picture shown in Picture No. 1 was created by an 11-year-old girl. In the narrative accompanying the picture, the child stated that her liver, stomach, and kidneys were happy, while her heart, lungs, and brain were sad. She drew herself in a side profile. A side-profile figure may indicate silence, concealment, or avoidance. The child is facing to the left in the picture, and the left side of the page is generally associated with negative or depressive emotions. She drew herself with a pointed chin, which may reflect a desire to appear strong or a need for support from others. The closed and straight-lined mouth suggests a controlled form of communication. Her hands are drawn in her pockets, which may indicate that she is hiding or suppressing certain emotions. Additionally, the presence of pockets in her clothing can symbolize dependency on the mother. The child drew her feet very small, which may signify feelings of weakness or low self-confidence. The facial expression, as reflected in the eyes, eyebrows, and mouth, appears anxious. The lines in the drawing are composed of short, light strokes, later reinforced with heavier lines, which may also indicate anxiety. Eraser marks are visible in the drawing, supporting the interpretation that the child experiences anxiety and struggles with self-confidence. The limited use of color further supports the presence of negative emotions. The absence of color and large white spaces on the page may suggest suppressed emotions. Based on both the child's narrative and her drawing, it can be inferred that she holds negative feelings toward her illness.

Picture no: 10.



The picture shown in Picture No. 10 was created by an 8-year-old boy. The drawing lacks age-appropriate proportionality. Given that the child has no known cognitive or physical impairments, the sketchy and scribbled nature of the lines suggests an introverted personality. The presence of numerous eraser and pencil marks throughout the drawing may indicate anxiety and self-confidence issues. The human figure in the drawing shows notable disproportion: the head, legs, and feet are drawn very small, while the torso, arms, and especially the hands are exaggerated in size. This may reflect the child's perception of himself as older or larger than his actual age. According to his mother, the child is unable to play with peers due to his illness and tends to spend time with adults (e.g., mother, father, aunt), often trying to solve problems on his own. This social environment may contribute to the child viewing himself as more mature. The oversized hands can symbolize a desire to be physically strong and capable. The small feet may indicate low self-esteem. Similarly, the disproportionately large arms suggest a need for communication; the drawing implies that interacting only with close family members may not be enough for the child and that he has a desire to connect with peers. The eyes are drawn as faint dots, and the straight-lined mouth gives the figure a generally unhappy expression. The use of brown—often associated with pessimism in children's drawings—further supports the presence of negative emotions. Although the child verbally stated that “everything is fine,” the drawing details suggest he is experiencing suppressed and distressing feelings.

Picture no: 4.

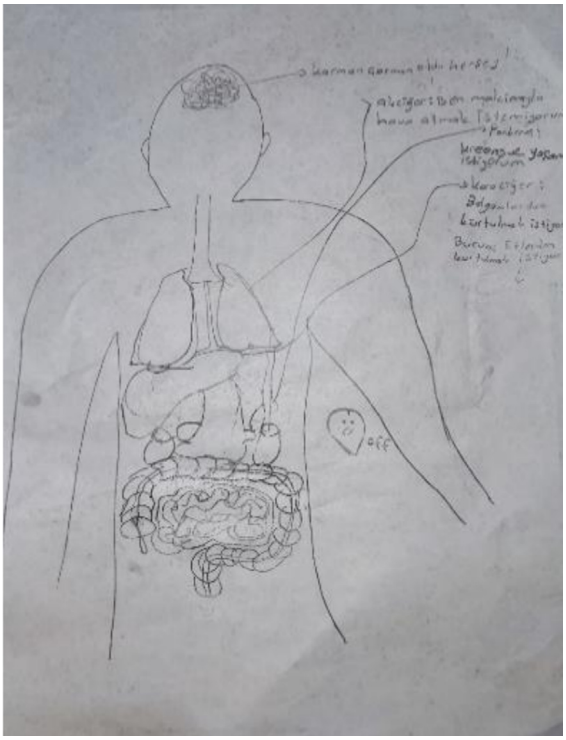


The picture shown in Picture No. 4 was drawn by an 11-year-old boy. In the story of the picture, the boy said that his brain, heart, lungs, and kidneys were happy, his intestines were confused because they hurt, and his bones were sad due to the restriction of their movements after the diagnosis of osteoporosis. Although the child had crayons available while drawing, he chose to draw only with a black pencil and did not use any other colors. He has drawn the nose, eyes, mouth, arms, fingers, and feet, which are appropriate for his developmental stage. However, he has left out the ears. The omission of the ears may suggest a reluctance to listen to the environment and frequent criticism from both the environment and family. The child drew eyes for himself, but left them empty and did not draw the pupils. It is known from the child's medical history that he has not experienced any problems with his eyes or vision. Empty drawings with no pupils symbolize a lack of communication and emotional emptiness. On the other hand, the child's use of only black can be interpreted as an emotional void and a lack of emotional support. It is known that the child has a history of frequent infections and continues to receive education at home instead of attending school to protect himself from infections. The fact that the child did not attend school with his peers may have affected his social life and interest in the environment. Additionally, the child drew his arms open. This drawing may indicate that the child intended to communicate. In the picture, the child has drawn some of his organs affected by the disease in a sad manner. It can be inferred that the child feels sadness, experiences difficulty, and has a negative perception of the disease due to the pain and limited movement caused by it.

Subtheme: Psychosocial Problems

In this subtheme, it was determined that the children's drawings exhibited characteristics such as feeling depressed/unhappy, suppressing their emotions, emotional emptiness, anxiety, anger/aggression, feeling worthless, and feeling different from their peers.

Picture no: 9.



The picture presented in Picture No. 9 was drawn by an 11-year-old boy, who also has a diagnosis of Type I Diabetes. The child has written the expressions of his organs on the picture to indicate their feelings. According to these, the brain says, *"Everything is a mess!!"*, the lungs say, *"I don't want to get air with a machine"*, the pancreas says, *"I want to live without Kreon"*, the liver says, *"I want to get rid of phlegm"*, the nose says, *"I want to get rid of nasal polyps"*, and the heart says, "*Off*".

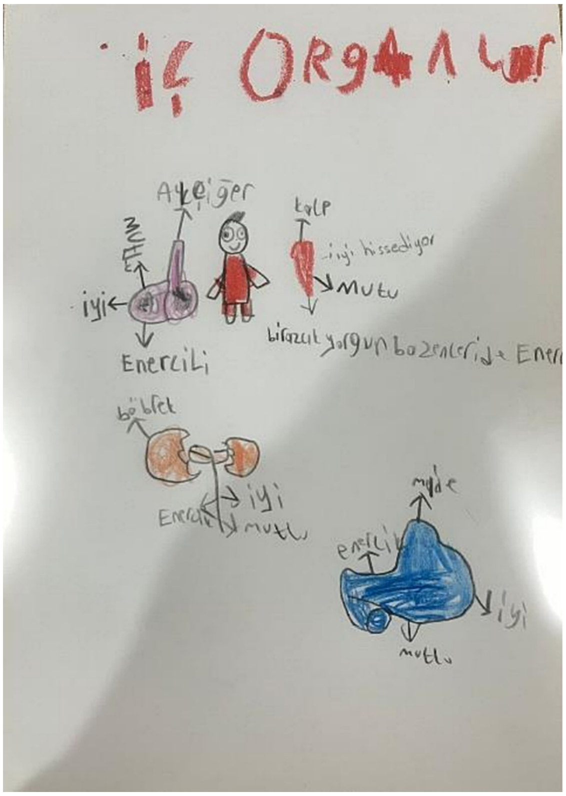
Although the child had crayons with him while drawing, he chose to draw only with a black pencil and did not use any other colors. This may suggest that he feels negativities such as passivity, weakness, and fatigue. The child has drawn a picture that covers the entire page and does not fit within the boundaries. When examining the body drawing, the child has depicted a stronger body. What the child desires may be to be physically stronger. Although the child is physically weak and short, the fact that he has drawn himself with a wide and muscular body reflects his desire to be strong. The child left out organs such as the eyes, nose, and mouth from his face and only drew his ears. The omission of his face suggests a depressive state. The expressions of the child's organs further support the presence of depressive feelings.

The child's omission of eyes may indicate the presence of negative emotions, the absence of a nose may suggest feelings of worthlessness, and not drawing a mouth could reflect a negative attitude and a desire for isolation. The lack of a neck in the drawing may indicate an inability to make independent decisions and a sense of dependency on the caregiver. While the child drew his arms, he did not draw his hands. Leaving the hands at the wrists might symbolize controlled communication and suggest feelings of inadequacy in communication. The absence of color may indicate suppressed emotions. The child not drawing his feet and legs could suggest a lack of self-confidence and a need for support in this area. In the picture, the child has given voice to his organs, writing their complaints and desires. It can be inferred that the child's mind is confused and he experiences negative emotions due to his diseasse. Additionally, it appears that the child has a negative perception of the treatment of the diseasse.

Subtheme: Low Self-Esteem

In this sub-theme, children have reflected their low self-esteem, lack of self-confidence, and fear of criticism in their drawings.

Picture no: 7.

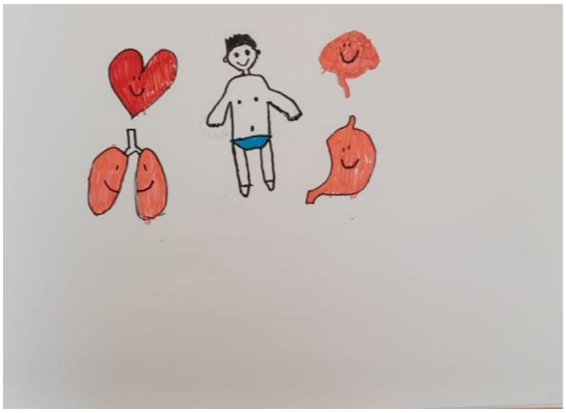


The picture in number 7 was drawn by an 8-year-old boy, who preferred to use the paper vertically. In terms of size, he has drawn himself much smaller compared to the page. This drawing may indicate that the child has low self-confidence. The child did not draw ears in his drawing. Children who are criticized by their family or surroundings, or who do not want to hear criticism, may avoid drawing ears. The child did not draw a neck in the picture. The absence of a neck at this age shows that the child still struggles with making decisions independently and feels dependent on the caregiver. The child has drawn large eyes, which may suggest that the child could be anxious. Additionally, the choice of red may also indicate anxiety. In the picture, the body, legs, and arms are drawn with angular shapes. The fact that the child draws his feet small in the picture indicates low self-confidence. In the picture, he has drawn himself with a happy expression, and his organs appear energetic and joyful. The fact that his organs do not wish for any change suggests that he does not attribute a negative meaning to the illness. He simply mentioned that his heart sometimes feels tired and that it tells him not to run too fast. In the picture, he has drawn his lungs and heart, which are closest to him. It can be inferred that the child's thoughts are primarily focused on his lungs and heart, indicating that he places greater importance on these organs.

Subtheme: Dependency on Care

In this sub-theme, children have reflected in their drawings a sense of dependency on their caregivers.

Picture no: 8.

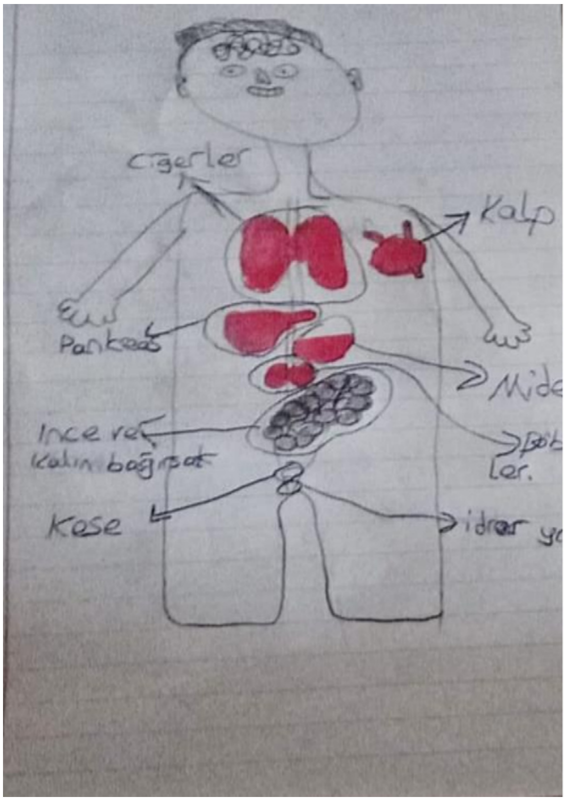


The picture given in number 8 was drawn by a 12-year-old boy. The child stated that he did not draw clothes because he wanted the researcher to see the shape of his own body. The fact that the child did not draw clothes and drew himself half-naked may indicate an increased interest in sexuality. Drawing himself at the top of the page and in the air shows that the child does not feel safe or confident. The child has drawn his eyes as completely black dots. Representing the eyes as dots suggests a desire to avoid perceiving external negativities and indicates a dependency on the caregiver. The child did not include a nose in his self-portrait. In drawings, the nose symbolizes a sense of self-worth. The absence of a nose in the child's drawing may indicate that he perceives himself as lacking value. The child depicted his neck as thin and short in the drawing. Drawing a short neck may indicate difficulties with anger management. Drawing large arms shows that the child seeks attention and connection. Proportionally large hands compared to the arms symbolize an attempt to compensate for perceived weakness. Arms extended to both sides indicate that the child is open and willing to communicate. Children in this age group are not typically expected to include belly buttons in their drawings. When a child draws a belly button on themselves, it may indicate continued dependence on their caregiver. Drawing small feet in the picture may indicate that the child has low self-confidence. Although the child wished for the disease to heal and for his organs to function healthily, he conveyed that all his organs were happy and illustrated this in his drawing. This shows that the child did not exhibit a negative attitude toward his illness.

Subtheme: Negative Body Image

Within this sub-theme, children expressed the negative impact of the disease on their body image through their drawings, including desires to appear physically larger and stronger.

Picture no: 3.



The drawing in image number 3 was drawn by a 12-year-old boy. The child included age-appropriate details, such as the ears, nose, eyes, mouth, and fingers, in the picture. The child has drawn himself in a manner that nearly fills the entire page. This drawing symbolizes his desire to be physically strong. According to the child's narrative, he is shorter and weaker than his peers. Given this context, the child's decision to depict himself so large as to cover the page can be interpreted as a wish to be physically larger and stronger, reflecting a negative body image. The child has depicted large eyes and small pupils in the drawing. This representation suggests that the child is experiencing anxiety. The depiction of teeth may indicate a tendency toward verbal aggression. The child has drawn his arms shorter in proportion to his body. The depiction of thin and short arms may suggest that he experiences communication difficulties. The absence of feet in the picture symbolizes that the child does not feel strong and feels dependent on the mother. The thin and long neck reflects the child's control mechanism and suggests that he has a controlled communication style. The child stated that all of his organs, except for his stomach, were happy, but his stomach was not because he had to eat a lot. Children with CF must consume many high-calorie foods throughout the day to compensate for the calorie deficit. It can be concluded that the child is dissatisfied with his eating habits in CF, but he does not have a negative perception of the disease. The fact that he only colored his internal organs and depicted them as happy, despite the availability of colored pencils, suggests that he has come to terms with his condition.

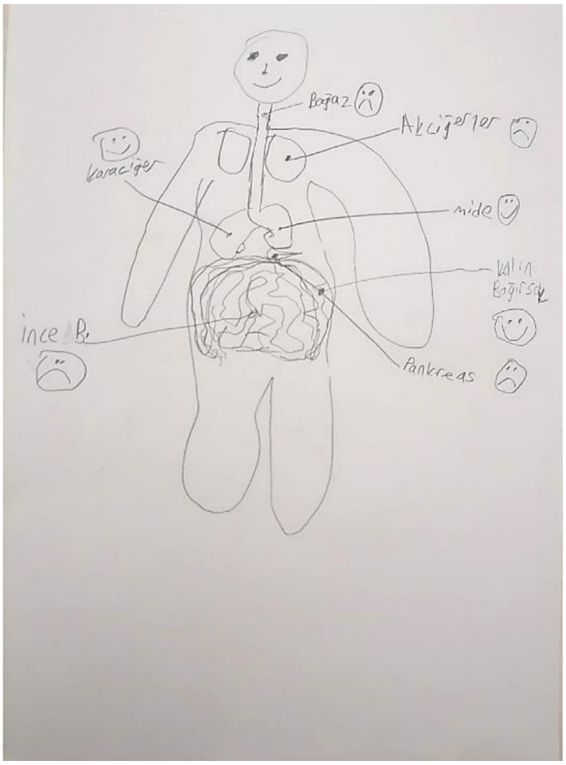
Theme 3: Needs and Desires

In this theme, children reflected their desire to avoid negativity, as well as their need for attention, emotional support, and communication in their drawings.

Subtheme: Desire to Communicate

In this subtheme, children's drawings reveal a clear desire to initiate communication, indicating their need to be heard, noticed, and emotionally connected with those around them.

Picture no: 2.



The picture shown in Picture No. 2 was drawn by an 11-year-old boy. However, despite being drawn by an 11-year-old, it is not age-appropriate. The absence of ears, the omission of hands and feet, the lack of proper age-appropriate proportions, and the failure to include details such as hair and clothing indicate that the drawing is not age-appropriate. Intentionally drawing disproportionate, distorted, and unattractive images may be a sign of an antisocial tendency. Upon closer examination of the picture, the absence of ears may be interpreted as the child being closed off to criticism, rejecting external negativities, and growing tired of hearing them. This is because the child has depicted his unhappy side by portraying his organs as unhappy. The child chose to draw exclusively with black pencils and did not use any other colors. The absence of colored pencils suggests that he may be in need of attention, support, and love. The child has drawn a thin neck in proportion to his head and body. A thin neck may indicate that the child's control mechanism is dominant and that he tends to regulate his emotions and desires. The child did not draw ears for himself. The absence of ears may suggest that he does not want to hear the negativities coming from outside. The child has painted his eyes completely black in the form of dots. The use of dots for the eyes may indicate the child's desire to avoid seeing external negativities and his dependency on the caregiver. The child has drawn his arms very large. Very large and long arms may indicate that the child needs love, attention, and communication. The absence of hands also suggests that the child may have difficulties with communication. Not drawing the feet may reflect that the child does not feel strong and may have issues with self-confidence. Additionally, drawing the legs in an unbalanced and shapeless manner could indicate a desire for independence. The child expressed the emotions of his organs by drawing facial expressions in the picture. Accordingly, the throat, lungs, pancreas, and small intestine are depicted as unhappy. In CF, the tendency to throat infections increases, and the lungs, pancreas, and small intestine are among the organs most affected by the disease. Because these organs are heavily impacted by the disease, the child drew them as unhappy.

Subtheme: Desire for Understanding, Love, and Attention

This subtheme reflects the children's need to feel understood, loved, and emotionally supported.

Picture no: 6.

The drawings in Image No. 6 were made by an 11-year-old girl. She used the page horizontally and depicted herself in the center with various colors and age-appropriate details. The large size of her head is often seen in children who are worried about academic performance. A large part of her face is occupied by carefully drawn, prominent eyes. Eyes are commonly seen as symbols of communication and connection; thus, their size and detail may reflect a desire for attention and understanding from others. This also indicates her curiosity and anxiety about academic success. She drew three fingers on each hand, which might suggest a tendency to get bored easily and a wish to improve academically. The absence of a nose might indicate feelings of low self-worth. Her broad, rounded shoulders may reflect a desire for physical strength. Accessories like earrings and hair clips suggest an interest in attracting attention. Her big smile and use of bright colors convey a generally happy mood. When asked to draw her organs, she only drew her heart and lungs on separate pages, suggesting her focus on illness symptoms. The lungs show a mocking expression, while the heart looks sad or angry. Yet, she said both organs were happy, possibly indicating difficulty expressing or a tendency to hide negative feelings about her illness. Still, her drawings reveal subconscious negative emotions related to her condition.

Discussion

This study explored how children with CF perceive their disease and its impact on their lives through picture analysis. Understanding how children view their illness, along with their emotions and thoughts, is crucial for developing effective psychosocial interventions. In this regard, picture analysis offers valuable insights into children's perceptions.

Some children had a positive perception of the disease, while others had a negative perception. These differences may be related to the severity of symptoms and the organs affected, particularly the lungs and gastrointestinal system (Conk et al., 2013). Some children portrayed the organs affected by the disease as unhappy, while others remained positive. Factors such as high-calorie diets, mask use, additional diagnoses, and lifestyle restrictions probably contribute to these negative perceptions. Similar studies with children suffering from chronic illnesses have also reported that children perceive their diseases as routine, burdensome, associated with complications, and as a source of fear regarding treatments (Cotter, 2016; Dickinson & O'Reilly, 2004). In this study, in addition to their perception of the disease, children also expressed their expectations regarding their health status. Children with a positive perception of the disease reported satisfaction with their current organs. It can be said that these children have accepted and normalized the disease. For children with chronic illnesses, accepting and normalizing the disease as a part of life helps improve adherence to both the disease and treatment (Cotter, 2016; Shorey & Ng, 2020). On the other hand, children with a negative perception of the disease expressed a desire for healthier lungs, no restrictions on physical movement and nutrition due to CF, and a life without medication. Within this sample, there is no positive perception in the pictures of children receiving modulator treatment, unlike those of other children.

The impact of chronic diseases on children varies depending on factors such as disease severity, symptom frequency, treatment, family, and social attitudes (Ball et al., 2017). The study found that CF and its treatment process affect many areas of children's lives, and the children reflected these impacts in their drawings. Most chronic diseases are also accompanied by psychosocial issues. In this study, it was determined that children experienced psychosocial problems due to CF. The children expressed feelings such as depression/unhappiness, emotional suppression, emotional emptiness, anxiety, and anger/aggression in their drawings as a result of CF. Other studies have reported that psychological distress is common among children with CF, with anxiety being particularly prevalent (Gundogdu et al., 2019; Kimball et al., 2021). Another study mentioned that CF symptoms and the burden of treatment led children to experience feelings of fragility, stigmatization, fear of illness, social isolation, loss of control, and anger (McCarrier et al., 2020). As many chronic diseases are diagnosed in infancy or early childhood, the level of cognitive development and lack of information are insufficient for children to develop an informed understanding of the diagnosis. As children grow and develop, they often feel sad, angry and depressed and perceive their illness negatively once they realize the effects of the disease (Shorey & Ng, 2020). The sample group in the study consisted of school-age children who had just started to learn about their illnesses, entered a new social environment such as school, and had developed cognitive skills. Therefore, their drawings reflect psychosocial difficulties and negative emotions as they begin to realize the differences in themselves and the effects of the disease. Alongside these difficulties, the children's drawings also revealed a strong emotional need to feel understood, loved, and emotionally supported, which is consistent with research highlighting the importance of emotional support in pediatric chronic illness care (Compas et al., 2012).

The majority of children were observed to have reduced socialization. Children with CF, in particular, exhibited communication difficulties, emotional suppression, a preference for controlled communication, and limited peer interaction. To avoid infections, protective measures such as limiting social activities or home education are likely to have contributed. CF treatments, symptoms, comorbidities, and frequent hospitalizations all have a negative impact on children's identity, academic performance, and social lives (McCarrier et al., 2020; Jamieson et al., 2014). Furthermore, parents frequently postpone preschool enrollment due to infection risks (Prieur et al., 2021), limiting early peer interaction and impairing emotional and social development. According to research, belonging, peer interaction, and competition are more important to children with chronic illnesses than participation itself (Nap-van der Vlist et al., 2021). Difficulties in forming friendships could lead to long-term isolation. Difficulties in forming friendships may lead to long-term isolation (Janin et al., 2018). Unlike other chronic diseases, face-to-face peer support poses infection risks for children with CF (Francis et al., 2020). While adolescents access peer support through social media, younger children lack such alternatives. Since this study focused on children aged 8–12, their drawings likely reflected the decline in socialization and their need for communication. In several drawings, children depicted themselves without mouths or with closed expressions, which may symbolize an unmet desire to communicate. This aligns with literature indicating that children with chronic conditions may have difficulty verbalizing their emotions and often turn to non-verbal ways of expression (Kayacan Keser and Eren, 2015; Volans & Brown, 2021).

Another prominent issue reflected in drawings was body image dissatisfaction. Children with CF often have a lower body mass index (Darukhanavala et al., 2021; Pizzignacco & Lima, 2006). Some children illustrated exaggeratedly strong bodies, signaling a desire for physical strength and feelings of difference from peers. Research confirms CF's negative impact on body image (Darukhanavala et al., 2021; Lyons & Muther, 2024). This reflects how children with CF may internalize feelings of physical inadequacy, which has been previously associated with chronic illness and delayed growth in childhood (Darukhanavala et al., 2021; Helms et al., 2017). Body dissatisfaction can begin in childhood and intensify in adolescence (Helms et al., 2017). School experiences make children more aware of physical differences, like stature, coughing, and medication use, which can lead to bullying (Pizzignacco & Lima, 2006). One child reported being mocked for medication use. Literature also notes bullying linked to medication, coughing, and body appearance (Branch-Smith et al., 2018; Fairweather & Jones, 2022).

Children with CF have a high level of dependency on primary caregivers for their care needs (Fitzgerald et al., 2018; MacKenzie et al., 2014). Children with CF rely on their parents for support in managing the daily treatment and care routines, medication administration, monitoring of medication use, and preparation or cleaning of equipment (Grossoehme et al., 2013). In the current study, the majority of children indicated that they felt dependent on their primary caregiver for care. Since the transfer of responsibilities from parents to children, as well as the development of independence in self-care skills, usually occurs during adolescence (Torun et al., 2024), it can be concluded that the children in this study have not yet achieved independence in self-care skills. On the other hand, some children depicted their dependence on their parents in their drawings, while simultaneously expressing a desire for independence. It is important for parents to recognize these requests of their children and support them in acquiring self-care skills appropriate to their age and developmental characteristics. Beyond physical care, children also develop strong emotional dependency on caregivers, which may lead to ambivalence between wanting autonomy and fearing separation. A study has also shown that disease management in adolescents with CF remains inadequate even during the two years immediately preceding the transition to adult care, and the importance of children assuming responsibility for disease management as early as possible has been emphasized (Faint et al., 2017).

A striking aspect of the study is that some children's drawings and the emotions they express do not align. This could indicate that children are suppressing their emotions or avoiding expression, and that communication methods, such as picture analysis, may serve as supportive tools for understanding children.

Strengths and limitations

Since this study was conducted using qualitative methods, it is not possible to generalize the research results. While the small sample size could be considered a limitation, the study's qualitative nature and the replication of the data are strengths. Conducting the study within a single family support group allowed children with similar sociocultural values to be reached. The picture analysis method is inherently prone to bias. However, to prevent this, an expert opinion on the picture interpretations was obtained from a clinical psychologist familiar with the sample group and specialized in picture analysis. Furthermore, to prevent bias, children were asked to verbally describe their pictures. While this study demonstrates that children with CF share similar experiences within the study sample, it is limited by the sample size. It is possible that children from different sociocultural and economic backgrounds may produce pictures with different characteristics. Moreover, this study can provide valuable perspectives on how children perceive their illnesses; although positive perceptions are generally unexpected, this research has demonstrated their presence.

Conclusion

As a result of the current study, it has been found that children with CF avoid using colors in their drawings, create drawings that are either larger or smaller than normal, have both positive and negative perceptions of CF, and experience issues related to socialization, body image, self-esteem, and psychosocial problems. Some of the children in the study were receiving triple therapy or Ivacaftor, which are known to alleviate many CF-related symptoms. The drawings created by these participants reflected nuanced emotional states. While verbal expressions were generally positive, the visual elements of their drawings—such as limited color use, disproportionate body figures, and facial expressions—revealed traces of anxiety, suppressed emotions, and social withdrawal. Despite clinical improvements associated with advanced treatment, these drawings highlighted the continued psychosocial challenges faced by children with CF, particularly in relation to emotional expression and social connection. It is recommended that health professionals explore new methods to understand the feelings and thoughts of children with CF, participate in policy development for psychosocial interventions targeting communication, body image, self-perception, and emotional well-being that begin at an early age and are sustained over time, and contribute to the development of digital interventions aimed at enhancing socialization.

Relevance for clinical practice

This study highlights the complex psychosocial challenges faced by children with CF, emphasizing the importance of incorporating innovative approaches to understand their emotions and perceptions. The findings suggest that children with CF often express their experiences through drawings that deviate from typical norms, such as avoiding color or producing unusually sized images. These patterns reflect underlying issues related to socialization, body image, self-esteem, and psychosocial well-being, as well as ambivalent perceptions of their condition. Health professionals are encouraged to explore creative and child-centered methods to gain deeper insights into the emotional and cognitive experiences of children with CF. Additionally, the study underscores the need for early and sustained psychosocial interventions targeting communication, body image, self-perception, and emotional well-being. It also calls for the development of digital tools to enhance socialization and reduce isolation. These efforts, combined with policy initiatives to ensure long-term support, can contribute to a more comprehensive approach to the care of children with CF, addressing both their physical and psychosocial needs. Picture analysis appears to be a valuable tool for gaining deeper insight into the psychological experiences of children with CF. This method may help clinicians better understand symptoms that affect quality of life and identify children who struggle with therapy adherence. Integrating picture analysis into clinical practice could enhance patient-centered care and provide tailored psychosocial support for children with CF.

CRediT authorship contribution statement

Selin Söyünmez: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Yağmur Sezer Efe:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Formal analysis, Conceptualization. **Mehmet Köse:** Writing – review & editing, Writing – original draft, Supervision, Conceptualization.

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Declaration of competing interest

The authors wish to declare no potential conflicts of interest.

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