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# Healthcare clowning in a paediatric allergology department: perspectives of children, their parents, medical staff, and clown artists

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## ABSTRACT

**Background:** Invasive medical procedures can be distressing for child patients and their parents. This distress can reduce the cooperation with medical staff, making the treatments more difficult. This study examines how healthcare clowning affected children, their parents, and medical staff during procedures in paediatric allergology, and includes the perspectives of the clown artists on their work in this setting.

**Methods:** Ethnographic observations included 130 children (5–17 years old), 46 parents, 12 medical staff, and five clown artists. Semi-structured interviews were conducted with children, parents, and medical staff, while a focus group discussion was held with the clown artists. Data were analysed through qualitative content analysis.

**Results:** Healthcare clowning reduced anxiety and diverted attention from procedures among younger children, whereas older children engaged less with the clowns. Parents reported feeling calmer and experienced greater mutual support. Staff described smoother workflow and improved ability to focus on clinical tasks. Effective delivery relied on co-creation between artists and medical staff.

**Conclusion:** In paediatric allergology, healthcare clowning provides psychosocial support, particularly for younger children and parents, and can support the work of medical staff when integrated into clinical routines. Reduced engagement among older children underlines the importance of developing context- and age-sensitive models of clowning to maximise its benefits.

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Arts for health; hospital clown; emotional support; specific immunotherapy; invasive procedures

## Background

For children, medical treatments can trigger strong emotional responses such as irritation, anxiety, fear, anger, and distress (Çelikol et al., 2019; Rennick & Rashotte 2009, 2009). During invasive procedures, children often cry, resist, or are reluctant to cooperate with medical staff (Cook, 2016; Öztürk Şahin & Topan, 2019). Fearful behaviour and limited cooperation are major challenges for medical staff during procedures that require focus and collaboration with patients (Gomberg et al., 2020; Ives & Melrose, 2010).

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Medical treatments of children can also be distressing for parents. Up to 54% of parents suffer from acute stress disorder when their child suffers a life-threatening illness or injury (Muscara et al., 2015) and many worry about recurrence or deterioration (Palomares González et al., 2023). Parents' own psychological needs are often overlooked and may be insufficiently addressed within paediatric healthcare settings (Carlsson et al., 2019; Muscara et al., 2015).

In paediatric allergology, invasive medical procedures such as specific immunotherapy and skin tests are used to diagnose and treat allergies. These procedures can be uncomfortable or painful and carry a risk of allergic reactions ranging from mild to serious, including anaphylaxis (Bousquet et al., 1998). The procedures involve needles, and a systematic review and meta-analysis found that a majority of children under ten exhibit a fear of needles, as well as 20–50% of adolescents, and 20–30% of adults aged 20–40 (McLenon & Rogers, 2019). Parental anxiety can amplify children's distress (Racine et al., 2016).

Over recent decades, evidence has accumulated that artistic interventions in hospitals, including healthcare clowning, can benefit children, caregivers, and staff (Archambault et al., 2018; Christina et al., 2023; Fancourt & Finn, 2019; Lopes-Júnior et al., 2020). Healthcare clowning is delivered by artists trained to address psycho-emotional needs through the humour and other skills, such as music and magic (Dionigi, 2018). The craft of healthcare clowning involves shifting from the artist's own persona into a clown character with a "unique, paradoxical, and humorous point of view" (Dionigi et al., 2014, p. 59). Healthcare clowns describe their method as a process of establishing trustful, reciprocal relationships (Kontos et al., 2017; Kristensen et al., 2019), and they perceive their work as boosting patients' moods and stimulating their imaginations (Barkmann et al., 2013).

Studies report that healthcare clowning can reduce children's anxiety, distress, perceived pain, and time spent crying before or during invasive medical treatments (Arriaga et al., 2020; Dionigi et al., 2014; Ding et al., 2022; Fusetti et al., 2022; Kurudirek et al., 2021; Vagnoli et al., 2005; Vagnoli et al., 2010; Sridharan & Sivaramakrishnan, 2016; Wang et al., 2024). Pre-operative engagement with clowns has been associated with children feeling happier, calmer, and less worried (Costa Fernandes & Arriaga, 2010; Dionigi, 2018; Markova et al., 2021). In oral immunotherapy for food allergy, healthcare clowning improved reported quality of life among children aged 8 – 12 (Rigbi et al., 2021).

The presence of healthcare clowns can also have a positive effect on parents both indirectly, when they see their child enjoying the intervention, as well as directly, through parents' own interaction with the clowns (Ford et al., 2014; Santarpia et al., 2022; Wu et al., 2023). For staff, healthcare clowning has been associated with more efficient workflow, due to reduced aggression and greater compliance among children (Blain-Moraes et al., 2011; Efrat-Triester et al., 2021; Genizi et al., 2022; Yildirim et al., 2019). Clowns can also improve the moods of staff members and their communication with colleagues (Blain-Moraes et al., 2011; Krieger et al., 2022; Mortamet et al., 2017). This study contributes to that literature by examining healthcare clowning during allergological procedures, which involve repeated injections and heightened emotional distress. To assess whether healthcare clowning can provide psychosocial support during allergological procedures, we asked: (1) What effects does healthcare clowning have on children's emotional responses and their willingness to participate in specific immunotherapy? (2) What

effects does it have on parents' emotional responses and on the work of medical staff? (3) Because effectiveness also depends on integration into clinical routines, which forms of collaboration between medical staff and clown artists support delivery?

## Methods

To explore the effect of healthcare clowning on children, their parents, and medical staff, an ethnographic approach was used. Ethnography is well suited to describe, interpret and understand complex social settings where multiple actors negotiate meaning within cultural, social, and institutional contexts (Katie et al., 2019; Sue & Davies, 2013). Given the complex social dynamics in medical settings, ethnography is a useful and well-established method to collect data in hospitals (de Laine, 1997; Kelly et al., 2005; Pawson & Nick, 1997), during painful treatments (Kristensen et al., 2019) and during healthcare clowning activities (Kontos et al., 2017). Ethnographic observations were complemented by semi-structured interviews and a focus group to enable a triangulated understanding of the emotional, social, and professional dynamics surrounding healthcare clowning in paediatric allergology.

This research was carried out at the Department of paediatric allergology, rheumatology and clinical immunology, University Children's Hospital, in Ljubljana. Since 2017, healthcare clowns have provided activities from Monday to Thursday, for three and four hours per day, depending on the treatment schedule. Data collection (observations, interviews, and a focus group) was carried out by the first author (J.K.) between November 2022 and July 2023.

### *Setting and clowning intervention*

Children arrived for specific immunotherapy at around 8 a.m. accompanied by their parents. Parents typically remained with younger children throughout all four days of hospitalisation, whereas older children stayed on their own after admission. Groups of up to seven children underwent the therapy process together during all four days. During therapy, children received repeated injections with a small amount of allergen to reduce the immune system's sensitivity to that allergen: four injections on day 1, three on days 2 and 3, and one on day 4. After each injection, children were observed closely for 20 minutes for any allergic reaction before returning to their rooms.

A single healthcare clown interacted with the children, parents and staff in the therapy room, the ward and patient rooms. All clowns had specific training for work with young patients during stressful moments in the hospital environment. They wore red noses and minimal makeup and expressed their clown personas through distinct costumes and personality traits. During injections, the clown used props to divert attention, such as squeaky toys, flutes, a ukulele, or stamps and felt-tip pens to print or draw motifs on the child's free hand. During the observation periods on the ward, the clown connected with the group of waiting children through jokes, music, magic tricks and sketches. After therapies, the clown visited children and parents in their rooms, performing the same activities.

**Table 1.** Demographic data of study participants.

Group	Interviews	Focus Group	Observation
Younger children (5–10 yo)	3 girls/6 boys	/	/
Older children (11–17 yo)	2 girls/3 boys	/	/
All children (5–17 yo)	/	/	130
Parents	9 women/1 man	/	46
Doctors	1 woman/0	/	3
Nurses	5 women/2 men	/	10
Clowns	/	2 women/3 men	5

### ***Study participants and inclusion criteria***

Study participants comprised (1) children (5–17 years) undergoing specific immunotherapy due to more serious signs of allergic reactions to insect stings, (2) parents who stayed with their child during hospitalisation and were present for clowning activities, (3) medical staff involved in the treatment, and (4) healthcare clowns working in the allergology department (Table 1).

Parents of children scheduled for the immunisation therapy received an email invitation to participate in the study from the Head Nurse prior to admission (the hospital did not disclose the number of invitations sent). On treatment days, children and parents were informed again about the observation by J.K. All children and parents orally agreed to participate in the observation, with no refusals.

No gender nor age data were systematically collected among those who participated in the observations, because attempting to record demographic details in real time or during therapy sessions – especially for individuals who were not formally interviewed – would have potentially risked delaying immunotherapies. With this approach, J.K. tried to be consistent with the research goal of observing interactions with minimal intervention. Children were categorised into two approximate groups based on the researcher's estimation during fieldwork: younger children (around 5–10 years) and older children (around 11–17 years).

For interviews, J.K. used consecutive sampling on the day of admission as families arrived in the Department. Children whose parents agreed for them to participate in the interview were also asked directly about their willingness to participate. In total, 10 of 13 parents and all 14 of their children consented to an interview. The seven nurses who participated in the interviews were notified about the research and selected by the Head Nurse according to their work schedules and availability. Three paediatricians were invited to the interview via email; two declined due to time constraints. All five clown artists who worked in the allergology department during the study period agreed to join a focus group.

## **Data collection**

### ***Observations***

From November 2022 to April 2023, the first author conducted non-participant observations during specific immunotherapy and clown visits. Non-participant observation is

a research method during which the observer does not participate in or interfere with what is happening in a given social setting (Bryman, 2016). This method is well established in healthcare research (e.g. Katie et al., 2019). The choice of engaging in non-participant observation was agreed upon between the researcher, the physician and the artistic coordinator of the clowning organisation to minimise disruption of the medical procedures and the interactions between clowns and patients. The researcher positioned herself discreetly in one corner of the therapy room or on the ward and observed interactions among staff, clowns, children and parents.

Daily observations lasted between three and four hours, with an average time of circa three hours a day. The observations took place over 24 weeks, for a total of 288 hours, and included 130 children, 46 parents, 12 staff, and five clown artists. Observations focused on (1) children's behavioural and emotional responses to specific immunotherapy and interaction with healthcare clowns, (2) parents' responses to their child's therapy and clowning, and (3) collaboration between medical staff and clowns. The participants' activities and reactions during the treatment were recorded in narrative form in chronological order in a field diary, during the observation period and shortly afterwards; 54 fieldnotes were produced.

### ***Semi-structured interviews***

In addition to observations, 32 semi-structured interviews were conducted between May and July 2023: 14 with child patients, 10 with parents/relatives and 8 with hospital staff (see Appendix A for interview guides). For interviewed children, gender and age were collected; for parents and staff, only gender was recorded. Interviews took place in quiet settings such as hospital rooms or quiet areas in the ward for children and their parents, or hospital offices for nurses and the doctor. Interviews lasted half an hour on average and were audio-recorded using a Dictaphone and tablet.

Interviews with children and parents were conducted on the final two days of treatment. The interview questions for children explored what they experienced during the immunotherapy, and whether they found the clowns beneficial. The youngest children (5–7 years old) were asked to choose among 20 illustrated-action cards (Epstein et al., 2006). This approach drew on the Photo Elicitation Interview (PEI) method, in which images are used to prompt discussion. In this study, the researcher selected her own photographs to symbolise emotional states – for instance, fear (fire in the woods), playfulness (water park), and happiness (children dancing). These images prompted conversations about how children felt during therapy while clowns were present. With staff members and parents who were less talkative due to their individual communication styles, the researcher shared some of her general observations to encourage a conversation. Observations were not discussed with children.

### ***Focus group***

A two-hour focus group with five clown artists was held in April 2023 at the clowning organisation's office. The session was audio-recorded using a Dictaphone and tablet. An additional focus group with medical staff was attempted but could not be scheduled due to insufficient ward coverage

## Data analysis

J.K. conducted a qualitative content analysis informed by an ethnographic approach, characterised by iterative cycles of observation, reflection, and interpretation (Hammersley & Atkinson, 2019). During the observation period, patterns in the reactions of different groups (children, parents, and staff) were noted and progressively refined through ongoing analytic reflection. Interviews and the focus group were then used to corroborate and explore these emergent trends, consistent with the iterative and interpretive character of the analysis (Steinar & Brinkmann, 2015). During the observations, a divergence between younger and older children's engagement and emotional reactions became apparent; this prompted an explicit division and comparison of these groups in subsequent analytic summaries.

Audio recordings from the interviews and the focus group were manually transcribed. Analysis proceeded through interpretive reading and writing, guided by J.K.'s field notes and supported by discussions with co-author D.H., who provided critical feedback on how to articulate, structure, and contextualise her findings. Co-authors M.R. and S.D. F. supported the drafting of results and situating the analysis within the literature. Triangulation was performed by cross-referencing the analytic summaries with observational field notes and interview/focus-group data to ensure consistency and credibility of the findings (Emerson, 2011).

As a researcher with personal experience of being hospitalised as a child in the same clinic, J.K. approached the study with heightened sensitivity to medical authority. Her initial assumptions were challenged during the observations, as she observed more compassionate, child-centred care practices than she had experienced as a child. She was particularly struck by how children were encouraged to play and were not criticized for expressing their emotions. This reflective positionality helped attune the analysis to emotional dynamics in the hospital environment.

## Ethics statement

This study received ethical approval from the Ministry of Health of Ljubljana with serial number 0120–508/2022/7. All participants were informed that interviews would be audio-recorded and that the material would be used for dissemination. All interviewed participants signed a consent form to participate in the research. For minors, written consent was provided by their parents. Children aged fifteen or older, legally authorised to consent to medical interventions and healthcare, signed the consent form themselves. All data were anonymised.

## Results

### *Younger children*

In the presence of a healthcare clown, 50 of 65 younger children were observed to be calm, willing to cooperate, and followed the instructions of the medical staff during skin tests and specific immunotherapy. Among the remaining 15 children, factors such as parental presence, personality and peer influence appeared to limit engagement. Clowns

helped most younger children manage their fear during interventions (mainly specific immunotherapy), a point raised by 7 of 14 interviewed children. Four children reported being so distracted by the clowning activities that they did not feel the needle. This was also noted during most of the observations. As one girl described: *“The clown was telling us a joke and while I was watching her, I totally missed when the nurse pricked me”* (Child 5). This report illustrates how distraction through humour can reduce awareness of a painful medical procedure.

All interviewed parents reported positive effects of clowning during specific immunotherapy. One mother explained: *“The clown approached the boy who was first to receive the therapy and showed him a trick, he did such a good job that the boy didn’t even realize when the nurse poked him with the needle. He didn’t have time to think”* (Mother 2). This mother’s observation reiterates how the clown’s distraction helped reduce fear.

Five of seven interviewed nurses noticed positive effects of the clown’s presence, especially in specific immunotherapy, where children were calmer and more cooperative, allowing nurses to work more quickly. Two nurses pointed out that the effect of the clown is more noticeable in skin tests, where roughly two-thirds of the children seemed less fearful in the presence of the clown. As Nurse 2 put it: *“I think that when there is no clown, they [children] are perhaps more serious [. . .]. Some of the children have the feeling that they are there under duress, but when the clown is around, it’s more fun, and easier for them to go through the therapies, especially younger children, who have an aversion to needles. The clown softens the atmosphere so that it is not so serious.”* The doctor described a similar idea: *“Clowns help us to divert attention in the moment when we do therapies which include poking children with the needle, and they have diverse ways of achieving this. Clowns’ preparation is certainly important [. . .]. This also includes the clowns’ interactions with the children and establishing contact with them before the procedure. Such an approach certainly relaxes the children because they know that they are on their side and will keep their mind off the procedures. With such an approach the clowns create a relaxed and a safe environment for the children”*. The conversations with Nurse 2 and the doctor highlight the role of the clown in transforming the clinical environment from tension and obligation to playfulness and comfort, helping younger children cope with fear and resistance during medical procedures.

### **Older children**

Older children generally showed indifference toward the clown, visible in their facial expressions, lack of communication and general disinterest in participating in clown activities. They sometimes smiled at the clown’s jokes, but that smile occasionally seemed forced. In interviews, three of five older children described the clowning activities as too “playful” or “immature”. On the first day of admission, three adolescents (15–17 years) found the clown visit ill-timed. *“The first day [. . .], I didn’t think it was the most suitable time for a clown’s visit. I barely got settled in the room and the clown was already there. It would be better if I could talk to my parents”* (Child 2) However, some older children acknowledge value during therapy sessions: *“I found it a bit annoying to have a clown visit on the first day, I wanted to spend that time with my parents alone. But in the therapy, it was interesting to have a clown with us [children], she made the time pass quickly. However, it was especially interesting for the younger children . . . ”* (Child 3). Overall, these accounts

suggest that older children preferred time with their parents at the start of the hospitalization. Older children appreciated the clowns' interventions during the immunotherapies but found them not fully suitable for their age group.

### **Parents**

During observations, 23 parents showed visible distress or agitation. The clown's presence and the calming effects on the children proved to be also positive for parents. *"As a parent, you're not sure how your child will take immunotherapy, because you know what it [the allergic reaction] was like at the peak. But it brings me peace to see how calm she is in the presence of the clowns and how brave and well she is participating in therapies"* (Mother 2). Such reports highlight the reassuring effect of clowns not only on children undergoing immunotherapy but also on their parents, who find comfort and relief in seeing their child calm, brave, and actively engaged during treatment.

The parents who stayed with their children in the hospital initially looked reserved and did not talk to each other. However, following the clowning activities, which often included parents, they began introducing themselves or singing together, which gave them the incentive to communicate and connect. Due to the established relationships, parents were then observed asking for each other's support, such as looking after the children whilst needing to leave the ward for a short while.

### **Medical staff**

During immunotherapy sessions, all 10 observed nurses remained focused and worked efficiently in the presence of the clowns. In interviews, five of seven nurses said clowns helped by diverting the children's attention. *"As far as I'm concerned, they [clowns] really have a positive effect, especially with immunotherapies, when you have a lot of other things in your head and you are not able to entertain, distract the children. It's great that the clowns are there to animate them. While the clowns are entertaining the children, we [nurses] can do more in the meantime. So, the clowns don't burden me, and they don't hinder my work in any way"* (Nurse 1). In addition to supporting children's emotional well-being, the clowns allowed nurses to focus more effectively on their clinical tasks. Six of seven interviewed nurses noted that when the clown was not in the ward, they themselves had to entertain the children. During the clown's absence, it was observed that the nurses and the doctor tried to distract or amuse the children while they worked.

### **Collaboration between healthcare clowns and medical staff**

The doctor explained that cooperation between the medical staff and healthcare clowns was essential. During specific immunotherapy, the medical staff and the clowns were observed as working in coordination. There was a general awareness of the role all parties played, with the nurse and doctor conducting the medical treatment and the clown creating the artistic activity around it. *"We see that each clown [...] already know[s] our work and what we need. It must be a big challenge for them, as well as for us, that they are not disruptive to our work, that the nurse manages to concentrate, even though there is more talking and some movement around her. However, it is very important that the nurse*

*performs the skin test or immunotherapy as it should be and that we do not make mistakes despite surrounding entertainment. And this is also one of the challenges of joint interaction”* (Doctor). All interviewed clown artists also emphasised the importance of checking boundaries when engaging with children, parents, and staff, to avoid disrupting clinical work. *“I’m constantly checking where the boundaries are, whether I can go a little further in the interaction or not [. . .]. And there is also the fact that there is someone new [nurse, doctor, etc.] that I don’t know, or I am new to them. And here, too, I am checking how far I can go in the relationship with them, so that they feel safe with me”* (Clown 5). Staff and artists both agreed on the importance of the clown’s awareness of professional boundaries and the need to continuously assess both staff and patient comfort levels.

The observations showed that the clowns were well received in the department and that the medical staff themselves reached out to the clowns to take part in skin tests and specific immunotherapy. As one clown reflected during the focus group, *“I think it’s very good that the starting point is that they [healthcare staff] invite us and that there is a desire on their part for us [clowns] to be present because then a completely different kind of collaboration happens. You don’t need to insist on coming next time, because they [healthcare staff] already want you to be there”* (Clown 3). Taken together, these observations indicate that when healthcare staff actively invite clowns and value their presence, it fosters a more genuine collaboration, supporting integration into clinical workflows and effectiveness of the intervention.

## Discussion

### **Children: stronger benefits for younger children**

Healthcare clowning organisations do consider the ages of children in adapting their interventions (De Faveri & Roessler, 2021), yet literature on healthcare clowning has typically analysed impact on children without comparing responses by age (Lopes-Júnior et al., 2020; Sridharan & Sivaramakrishnan, 2016; Wang et al., 2024). Where age has been considered, findings are mixed: one meta-analysis reported greater pain relief among younger children (2–7 years) (Ding et al., 2022), whereas another found stronger effects among older children (Fusetti et al., 2022). The present study adds to this discussion by providing observational evidence that age may influence the effect of clowning on paediatric patients. For younger children, clowning appeared beneficial: many were calm, distracted from needle insertion, and more willing to cooperate, which is in line with prior studies (Dionigi, 2018; Genizi et al., 2022; Kurudirek et al., 2021; Meiri et al., 2016; Sridharan & Sivaramakrishnan, 2016; Yıldırım et al., 2019). Together, these results support the view that artistic healthcare clowning can provide psychosocial support for younger children in paediatric allergology.

By contrast, most older children engaged less with clowns on admission day, as they preferred to spend that time with their parents. A recent mixed-methods study likewise found that while older children can benefit from clown sessions, they are sensitive to whether the activities feel age-appropriate; tailoring clowning to developmental needs was seen as essential (Melvin et al., 2025). Further research should continue to examine how clowning in paediatric allergology can be adapted across age groups to maximize its beneficial effect.

### ***Parents: emotional reassurance and peer support***

Observations and interviews indicate that seeing their child calmer during procedures had a calming effect on parents, echoing earlier work (Åsted-Kurki & Liukkonen, 1994; Mallet, 1995; Spitzer, 2006). Furthermore, this study showed that the clowns bridged communication barriers between parents. Parents were able to connect with each other and ask for each other's support. These findings suggest that healthcare clowning can provide psychosocial support for parents of hospitalised children, helping to lessen emotional distress (Carlsson et al., 2019; Muscara et al., 2015). Building on this, future research could explore how needs of parents whose children receive care in paediatric allergology vary depending on their child's age and the potential for clowns to meet those needs.

### ***Medical staff: relief from workload***

In this study, medical staff agreed that the work of the clowns diverted the focus of children away from invasive procedures and possible pain, and that they could focus on their work and perform the treatment more quickly as they did not need to entertain the children, which is consistent with previous research (Krieger et al., 2022). In the face of the high work burden of medical staff (CDC, Center of Disease Control and Prevention, 2024), healthcare clowning may therefore offer meaningful relief and support.

However, findings in the literature are not uniform. Some physicians report discomfort around clowns (van Venrooij & Pieter, 2017), while others have perceived limited benefits in certain contexts, such as surgeries (Vagnoli et al., 2005). Given the diversity of perspectives, future research should identify which factors facilitate or hinder collaboration between clowns and staff. A comparative analysis should also explore whether there are specific treatment contexts, such as allergology, in which clowning activities can be better incorporated than in others.

### ***Collaboration as co-creation***

Artists and medical staff agree that effective clowning depends on good collaboration and integration into ward routines, consistent with other qualitative studies (Barkmann et al., 2013; Blain-Moraes et al., 2011). These findings reinforce that clowning is not an isolated artistic performance, but a co-created process between artists and medical staff (de Kock et al., 2026). This study extends that literature by specifying how it is enacted during specific immunotherapy: staff invited clowns into the therapy room; clowns timed their engagement to the injection – observation cycle; they checked boundaries and stepped back when required; and both parties maintained clear role separation (staff led procedures; clowns managed the affective environment). Medical staff linked these practices to smoother workflows and fewer interruptions.

Taken together, these ward-level micro-practices specify operational conditions under which collaboration is experienced as effective in a procedure-intense setting. Attending to these conditions – invitation protocols, timing, and explicit boundary-work – offers practical guidance for integrating clowning into clinical routines. Greater attention to how clowns and staff co-construct the therapeutic environment may inform the development

of partnerships that maximise the benefits of clowning. Future studies could include more hospital wards and test which collaborative mechanisms most reliably improve psychosocial outcomes and workflow efficiency.

## Conclusion

This study indicates that, in paediatric allergology, healthcare clowning can reduce distress for young children, support parental coping, and create easier working conditions for medical staff, especially when clown – staff collaboration is deliberately co-created. While many existing studies focus on benefits for younger children, our findings also show that older children were more critical of clowning on admission day. This age-based divergence is underexplored in current literature and warrants further investigation to inform more age-sensitive approaches to healthcare clowning.

By situating these findings within the under-explored context of allergology, this study expands the evidence base on where and how clowning can be most effectively integrated into hospital care. Future research and program development should further explore how to tailor clowning practices to the needs of different clinical settings and age groups, and how to strengthen institutional support for their integration.

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## Author contributions

CRedit: **Jasmina Kuduzović:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Validation, Writing – original draft; **Maggie Roessler:** Writing – review & editing; **Silvia De Faveri:** Writing – review & editing; **Denise V. Hebesberger:** Supervision, Writing – review & editing.

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