

Children's interaction with a dog when having Animal Assisted Activity in paediatric hospital care

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ABSTRACT

The aim of the study was to investigate the interaction process between child and dog and how it possibly affects children's wellbeing during Animal Assisted Activity.

Children have reported negative feelings such as fear and anxiety when being cared for in hospital and various kinds of complementary treatment can alleviate this. Different complementary treatments, including interaction with a dog, can create positive emotions and the treatment has been reported to have both physiological and psychological beneficial effects. However, there is a lack of studies describing children's interaction with a dog.

This is an observational study, analysed from field notes with qualitative content analysis using a deductive approach. Children ($n = 49$) aged 3–18 years of age at a paediatric hospital voluntarily participated in the study.

The results are reported on a six-level scale that describes the child-dog interaction: 1. Passive interaction, 2. One-way non-spoken communication, 3. Facilitating the interaction, 4. Interaction by activity encouragement, 5. Interaction initiated by the child, and 6. Interaction through deepened interplay. All children attained level five. Eighty-nine per cent attained level six and these children interacted fully, having a two-way deepened interplay with the dog. Further, when the interaction proceeded to a deepened interplay this affected the children positively both physically and emotionally.

Structured Animal Assisted Activity with a dog that includes an introduction, an active part and a relaxing part is a suitable model to offer children in paediatric hospital care since the children attained a child-initiated interaction or interaction through deepened interplay.

1. Introduction

Children often describe negative experiences when being cared for in a paediatric hospital. Experiences such as anxiety and fear of hospital visits, anxiety related to undergoing surgery, and fear of painful procedures are common [1,2]. During hospital stays, the children are separated from their everyday life including family and friends [1]. To alleviate the negative experiences of hospital visits for children, different kinds of complementary treatments have been reported as effective [3–6]. Trained dogs, such as dogs in Animal Assisted Therapy (AAT), service dogs or facility dogs in health care also called Animal Assisted Activity (AAA) can be used as complementary treatment. Dogs in AAT/AAA have been reported in studies to have both physiological and psychological positive effects on children in paediatric healthcare [7–11]. Children's pain, stress, anxiety and irritation levels decreased after having AAT [7–9]. Their self-estimated wellbeing and feelings about being in hospital were improved and they became more positive. They also reported feelings of joy, happiness and surprise over meeting a dog in the hospital [7]. For the children, the dog could signify something normal in an otherwise unfamiliar world. The dog reduced stress in the

children when they were afraid or sad and bringing in a dog stimulated communication and interaction between the children and the healthcare professionals. Even parents could benefit from having facility dogs in place when their children were being cared for [11].

In Sweden, dogs are the most commonly used animals in AAT and AAA [12]. Dogs are animals that are likely to interact, socialise and play with strangers [13]. Young dogs tend to become less cautious of foreign objects and situations the more mature they become [14]. In an experimental study, dogs appeared to demonstrate empathic-like behaviour towards humans when they seemed sad, e.g. when the human pretended to cry, the dog acted as if it wanted to provide comfort [15]. Previous studies have reported that interaction with a dog can have beneficial effects, but there is a lack of studies describing how the process of interaction between children and dogs evolves.

Therefore, the aim of this study was to describe how the child-dog interaction process evolves and what the possible affects are on the children's wellbeing during animal-assisted activity with a dog in paediatric hospital care.

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2. Materials and methods

2.1. Design

A cross-sectional study design was used in the present study [16]. Data was collected by a participant semi-structured observation of child-dog interaction during AAA with a dog in paediatric hospital care at one time point per participant. Due to the nature of the study question, all participants were included to interaction with the dog (one-group).

2.2. Participants and settings

The study was performed at a tertiary hospital, at a ward for children with neurology, neurosurgery, orthopaedic, gastro-surgery and urology illnesses. Criteria for inclusion were children between 3 and 18 years, who were admitted to the ward for at least one day. To participate, the child and their parents had to understand the original language (Swedish). Only children in single rooms or alone in their room, were included. Exclusion criteria were children unsuitable for dog interaction, such as carrying multiple drug resistant bacteria, children with extensive wounds or eczema, or diarrhoea, immunosuppressed, or short intestine syndrome with central venous catheter for nutrition. Children who, on the intended day, were unavailable due to examinations or surgery were excluded. Due to inclusion criteria of eligible children at the ward on the day for data collection, one child was selected by a random generator for information about the study and asked to participate. If a child declined, another patient was randomly chosen among remaining eligible patients.

Information about the study was given to 62 children and their parents. After being informed, 12 children, aged 5–16 years of age declined to participate, due to pain (n = 1), tiredness (n = 2), unwillingness (n = 2), fear of dogs (n = 3), dislike of dogs (n = 1), allergy to dogs (n = 1), had already gone through many examinations (n = 1) or was about to leave the hospital (n = 1). Fifty children were included. One of the children chose to discontinue just prior to the session with the dog. Thus, 49 children were included in the present sample, 23 boys and 26 girls, between 3 and 18 years of age. The children had been admitted to the ward from one to 27 days before inclusion, see Table 1.

The dog used in the study was a female labradoodle, six years old at study start and she was trained and certificated for use with children in health care. A qualified dog instructor/trainer accompanied the dog.

Table 1
Demographic data (N = 49).

	n
Female/Male	26/23
Age in years	
3–6	8
7–12	18
13–18	23
Diagnosis	
Neuro oncology	6
Brain damage	4
Neurological condition	8
Minor surgery	2
Intermediate surgery	11
Major surgery	16
Trauma	2
Dog-owning families	15
Children with dog fear according to parents ^a	9

^a >5 on a scale 0–10 from no dog fear to a great fear of dogs.

The dog had a separate room at the hospital to retreat to before and after the session with the child. One session per day, with a maximum of three sessions per week took place. The dog’s wellbeing was followed during the whole study period by an ethologist, specialised in dog behaviour. No signs of stress were detected in the dog. The observer who was a doctoral student and a paediatric nurse, also prepared the child and parents in advance of the session.

2.3. Procedure and data collection

2.3.1. Information and consent

The children and their parents received verbal and written information about the study and gave written consent to participate. Children 15 years old or younger and children with disability were, when possible, informed orally. Their parents, either one or both, if present at the time for information, gave written consent. Four children, 16–18 years of age gave oral and written informed consent. Parents of two children in the age group of 16–18 years who were themselves unable to give written informed consent, gave written consent on behalf of their child. The study and the procedure have been ethically approved by the Regional Ethical Review Board in Uppsala, Sweden (Ref no 2014/167).

2.3.2. The dog-child interaction session

The session took place a few hours after the child and parents were given information and had agreed to participate. The dog instructor prepared the dog according to special hygiene routines [12,17]. The interaction started with a calm period of approximately 10–15 min for the child and dog to get to know each other. After that, an active period took place with dog tricks, guided by the instructor, which lasted for about 15–20 min. The tricks could include various activities with the dog. The dog for example picked up rings that the child threw, or the child could choose to play dice with the dog or hide treats in a puzzle for the dog to seek. The children could also train the dog to do different tricks like sitting, lying, being shy or spinning around. A period of relaxation of about another 10–15 min concluded the AAA. This gave the child the possibility to cuddle the dog and for them both to calm down after the active period. Finally, each child received a stuffed toy resembling the dog. The observation took place in the child’s hospital room. Present during the AAA were the child, the dog, the dog instructor and the child’s family (and the researcher).

2.3.3. The observation

The observation of the child-dog interaction followed a semi-structured observation protocol during the session (Appendix 1) [16]. The observation protocol comprised observations of what interaction occurred between child and dog, child and dog instructor and also child and relative of the child. In this study, interaction is defined as the social interplay between all individuals present (children, dog, dog instructor, relatives and researcher) in the room [18]. To elucidate the possible effects on the child’s wellbeing, the child’s facial expressions were observed, such as smiling, laughing, neutral face, quiet and crying [19, 20]. Further, body language, behaviour and verbal/non-verbal communication were observed during the session [16,18,21]. Field notes of the interpreted interaction were written in the observation protocol, both facial expressions and the body language. The notes were taken simultaneously and continuously during the observation.

The observation continued from the dog and dog instructor entering the room and until they left the child’s room. The observer/researcher [MLN] was already present in the room before the dog and instructor entered the room, sitting silently and close enough to observe the child without intruding upon the child’s interaction with the dog and the instructor during the session. The observer took field notes during the session. The total length of the observations was between 23 and 75 min (m = 40.33 min) and continued throughout the entire dog session.

2.4. Analysis

All field notes of the observations were transcribed within 24 h of the observation, resulting in 120 pages. The field notes were written as short summaries of actions in the room as well as the child's emotions and behaviour. An analysis matrix for levels of interaction between child and dog was constructed, inspired by a previously used analysis matrix [18]. The matrix described a child-centred approach for creating interaction between child and dog divided into six levels (Appendix 2). Qualitative content analysis by Elo & Kyngas with a deductive and manifest approach was used [22], identifying meaning units and sorting into the six levels of the analysis matrix. Thereafter data was analysed into codes that were categorised and subcategorised [22]. The analysis was performed closely following the field notes with careful consideration of the latent content, such as facial expression, body language and behaviour as it was described in the field notes. Reflection upon and discussion among all the authors was performed during the whole process until consensus was reached regarding the content and the formulated categories and subcategories [22].

3. Results

The results are presented in six levels of interaction between child and dog based on the content in the categories. Level one included passive-interaction, level two one-way non-spoken communication interaction, level three facilitating the interaction, level four interaction by activity encouragement, level five interaction initiated by the child and level six interaction through deepened interplay (Fig. 1). According to the analysis, all child–dog interactions reached level 5 of 6. It also showed that, when interplay between child and dog arose, the interaction positively affected the children both physically and emotionally.

Subcategories were formulated in every category (Table 2), and the content was described and illustrated with examples from the field notes. All 49 observed children were identified on levels one to five and on level six 44 (89 %) children were identified.

3.1. Level one, passive interaction

At first level the children and the dog were passive in the interaction. The dog instructor was active, greeting the child and others present in the room, informing in a one-way communication about the session.

3.1.1. Child and dog in first contact

The dog and the dog instructor entered the room. The child was quiet, looking at the dog or greeting the instructor. The instructor presented herself, the session and the dog. The communication was one-way from the instructor to the child or two-way between the instructor and the child.

Table 2

Categories and subcategories describing the interaction in the dog AAA.

Categories	Subcategories
Passive interaction	<i>Child and dog in first contact</i>
One-way, non-spoken communication	<i>Child and dog in physical contact</i>
	<i>The child's spontaneous reaction</i>
	<i>Child and dog interaction dependent on dog instructor bridging</i>
Facilitating the interaction	<i>Child introduced to active interaction</i>
	<i>Child and dog interaction, guided by dog instructor</i>
Interaction by activity encouragement	<i>Child and dog interaction encouraged by the dog instructor</i>
	<i>Child and dog interaction strengthened by relative's involvement</i>
	<i>The child's positive response, attracted by the dog's behaviour</i>
Interaction initiated by the child	<i>The child is affected by the physical interaction</i>
	<i>The child acting in interaction with confidence</i>
	<i>The child actively uses support in interaction with dog</i>
Interaction through deepened interplay	<i>The instructor interprets the dog for the child</i>
	<i>The child and dog in mutually interplay</i>
	<i>The child's involvement</i>
	<i>The child's communication during deepened interaction</i>

"The dog instructor says hello to the child and the older brother, then also to the mum and dad. The child sits still, looking at the dog." (Child 20)

3.2. Level two, one-way communication, non-spoken interaction

At level two, the interaction between the child and dog was represented by a one-way spoken or non-spoken communication from the child to the dog or verbally between child and dog instructor while the child had non-spoken interaction with the dog.

3.2.1. Child and dog in physical contact

The child started to have physical contact with the dog by patting or scratching. The patting could be tentative or with more confidence. They could also lay still on the bed just with the dog close by, resting her head on the child's arm or leg. The child was mostly quiet in this part of the session, listening to the instructor speaking to their parents, while they silently continued to touch the dog.

"The child smiles, lays out an arm so the dog can put her head on it." (Child 48)

3.2.2. Child's spontaneous reaction

The children were talking spontaneously about the dog, commenting on her fur or that she looked kind. Children with earlier experience of dogs talked about their previous experiences. Most children became

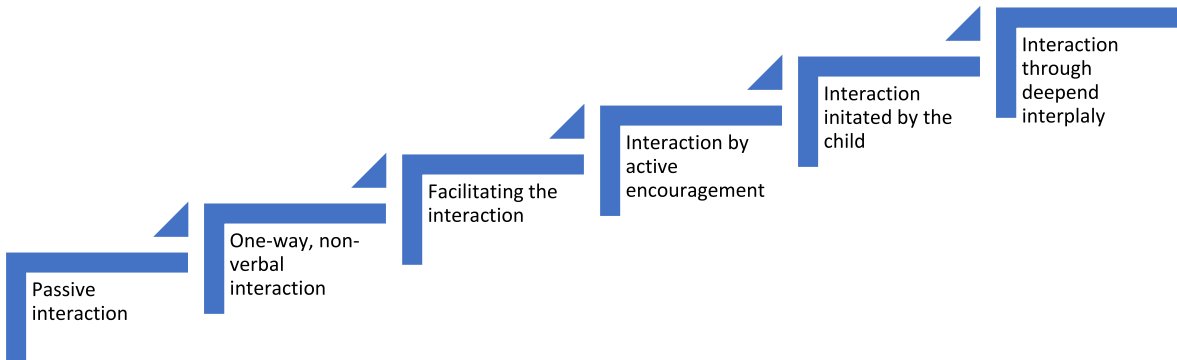


Fig. 1. Six categories based on the levels of interaction.

calm, looking almost tired at the same time as they had the dog physical close by. The dog also calmed down while laying close to the child and almost fell asleep.

“The child looks tired and calm. With their arm still, only their fingers moving. Blinking more and more slowly”. (Child 38)

Other children reacted as if they were afraid of the dog, by hurriedly moving away from the dog, asking if the dog would bite, or mentioning that they did not like dogs.

3.2.3. Child and dog interaction, the dog instructor bridging

The instructor acted as a bridge between the child and the dog, by positioning the dog on the child's bed, comforting for both parties. If a child was too intense, she also fended the child off slightly so that the dog would not be uncomfortable. She guided the child to learn more about the dog, such as where to be scratched or where was extra soft.

“The dog instructor pats and talks about the dog, shows her ears and point out that she smells good”. (Child 42)

3.3. Level three, facilitating the interaction

In level three the child was introduced and informed to actively interact with the dog. The child was actively interacting with the dog through guidance from the dog instructor.

3.3.1. Child introduced to active interaction

The child was told what was going to happen, when playing with the dog. The dog instructor encouraged and instructed the child on how to use the dog's toys and gave examples of what to do. She also established whether the child needed any special care, as for children in pain.

3.3.2. Child and dog interaction, guided by the dog instructor

The child was invited to interact with the dog, by asking if s/he would like to play and what kind of game to play. When the child seemed comfortable, the dog instructor prepared the dog's toys. If the child was reserved, the instructor gave examples of how to interact with the dog, such as instructions on how to act with the dog and what commands to use while doing the dog tricks.

“The dog instructor: Shall we see what we can play? What do you want to start with? We are going to do everything but you can decide what to start with. The child: It doesn't matter. The dog instructor: Shall we start with the rings then?” (Child 27)

3.4. Level four, interaction by activity encouragement

Level four contained interaction between the child and the dog dependent on active encouragement from the dog instructor. Some children needed encouragement from family members to interact with the dog. At this level, the dog's behaviour attracted positive responses from the children.

3.4.1. Child and dog interaction, encouraged by the dog instructor

The dog's behaviour was interpreted and explained to the child by the dog instructor, such as where the dog liked to be scratched. Helping the child to explore the dog physically, patting her soft ears or counting her teats to find out how many puppies she would be able to feed, while scratching the dog's belly together with the children. The child was encouraged to play with the dog, by asking if they would like to play a specific game or if they would like to do certain tricks. At this level, the child was able to choose the type of game and given instructions about how to perform it. When playing with the dog the child looked to the instructor for acknowledgement.

3.4.2. Child and dog interaction, strengthened by the relatives

If the child was reserved the child's family could be used to introduce the playing with the dog, either by letting family members perform the play, with the child watching, or by letting the family member interact together with the child.

“The dog instructor demonstrates that the dog can sit, lay down, sit nicely. The child is a little cautious, wants mum to do it, but does the hand signs together with mum and the dog instructor.” (Child 14)

3.4.3. The child's positive response, attracted by the dog's behaviour

During the observations, it was clear that the dog's behaviour led to positive responses from the children. Just by doing what she was asked to do the dog enticed the children to smile or laugh aloud. The children spontaneously commented out loud on how cute they thought the dog was while performing an activity.

“When the dog does as the child tells her the child smiles: Oh, God so cute!” (Child 38)

3.5. Level five, interaction initiated by the child

At level five the child was behaving with confidence in their interaction with the dog, both in the active play and in the relaxing phase where the physical nearness affected the children. The child took active support from the dog instructor when they needed to during the interaction.

3.5.1. The child is affected by the physical interaction

The child's physical closeness became intense. The child was relaxed and the dog appeared to be a more natural part of the environment. In the calm part of the AAA, both before and after the active play, quietness enveloped the room. The child became calm and still and sometimes even fell asleep or almost fell asleep. The dog also became calm and sometimes fell asleep beside the child. When cuddling the dog, the child was looking and smiling at the dog. It appeared that the child became more confident patting the dog and their facial and body language indicated satisfaction.

“The child turns to the side, nuzzles their nose into the fur on the dog's head, turns their back on the family, and spoons with the dog”. (Child 13)

The children expressed signs of positive effects such as mentioning that they might not need any more pain relief or that they became warm while cuddling with the dog.

3.5.2. The child interacting with confidence

The children communicated distinctly and confidently about the dog such as saying that she was calm, smelled good, was big or that she was clever. During the session the child expressed joy by smiling and laughing spontaneously. The child also spoke directly to the dog, such as praising her, telling her she was a “good girl”, or calling her a friend during play. In addition, the child communicated non-verbally with the dog instructor or the dog by using signs, body language or with different sounds when getting into contact with the dog. During the play the children talked in positive terms about how they enjoyed interacting with the dog.

“The child rolls the dice, tells the dog to sit down and ‘you are welcome’ or ‘it is your turn’ when the dog was to roll the dice. The child smiles and shouts out ‘yeah’, connects with the game and comments on the points they get”. (Child 44)

Those children who did not want to play a particular game or cuddle with the dog close by, expressed that clearly and the dog instructor responded by respecting the child's decision and suggesting another variant of interaction that the children could accept.

3.5.3. The child uses support in their interaction with the dog

During the interaction the child sought acknowledgement from the dog instructor or from family members. For example, to teach a sibling what they themselves had just learnt to do with the dog. Sometimes the instructor acted as the dog's voice, as a way of interpreting the dog's wishes. For example, if the dog wanted the child to scratch more while cuddling or if the dog found out a trick on her own and the child did not understand what was happening, the instructor explained what the dog wanted to say to the child.

"The dog put her paw over her head. The child to the dog instructor: What happened now? The dog instructor laughs. Looking at the dog: I think she became a little shy. The child, dog instructor and mum laugh, looking at the dog. The dog holds her paw over her head, wagging her tail." (Child 8)

3.6. Level six, interaction through deepened interplay

At level six, the child and the dog acted as equal partners in the interaction. They had mutual interplay responding to each other's actions. The interaction with the dog also encouraged the child to confidently and actively interact with their family members and the dog instructor on the child's initiative.

3.6.1. The child and dog in mutual interplay

While carrying out the interaction, the child and the dog had their own interplay without interference from the other people. While playing, the child took command by themselves, and the interaction became play between two playmates. When the child gave signals to the dog, the dog responded and gave signals back to the child who, in turn, responded. This happened both when playing with the toys and when doing tricks, as well when they were cuddling.

"The child: Fetch! The dog fetches the blocks and gives them to the child. The dog suddenly puts her head on the child's bed. Looks at the child, wags her tail. The child is laughing at her." (Child 34)

3.6.2. The child's involvement

The child entered the play as if s/he and the dog were equal playmates. The child talked to the dog as if she was a human and the dog gave feedback by looking at the child or offering physical contact.

"The child points: There, the last piece! The dog throws herself over the block and brings it to the child. Now you have to get a big one (searching in the treat tin to find the biggest bit)." (Child 13)

3.6.3. The child's communication during deepened interaction

During the session together with the dog, the child communicates with people in the room, distinct in both content and performance. They spontaneously communicate about the dog or about their own animals at home, and even interpret and give voice on behalf of the dog. They also present information about the dog, as well as inviting family members to interact with the dog. This ends up with the family gathered around the dog, praising the dog or playing together with the dog. The child also initiated communication about other subjects important to them.

"The child uses sign language and laughs, daddy interprets [to the dog instructor]. The child signs about different cartoon movies and tv-shows. Swiftly changes between different films or tv-shows. Daddy to the child: Now you were very alert, sweetheart!" (Child 3)

4. Discussion

All the children initiated interaction with the dog. The majority of the children had a deep interplay with the dog during which they were acting with confidence. The interaction attracted mixed responses from

the children, as they could act reserved or in a positive and courageous manner. The children expressed that the dog brought joy and happiness, but the interaction also created quietness and peacefulness, as well as bringing the family together.

4.1. The child and dog interaction

In the context of paediatric hospital care the children participated in the dog interaction with social interplay and verbal/non-verbal communication guided by a trained dog instructor as a facilitator. All the children (3–18 years) were identified in the results as being at levels one to five. At levels one to four, the dog instructor took an active part in supporting the children by bridging, guiding and encouraging interaction with the dog and responding to the children's wishes. This interaction can be of significance, since parents to children in paediatric care express the need for good interaction and communication between children, parents and healthcare professionals. This should be achieved by building relationships, exchanging information and promoting engagement [23,24]. Animal Assisted Activity can be a bridge to the beneficial interaction that the parents request for their child. At level five, all the children took an active part physically or verbally in the play or by rejecting the dog. At level six, the interaction deepened through interplay and two-way communication taking place without the involvement of the instructor. At levels five and six, the instructor withdrew to let the child and dog interact without interrupting when the interplay deepened; while the child took the initiative to make decisions independently in the interaction. Further, guidance in their decision-making participation is imperative to achieve good interaction between children and/or parents and healthcare professionals as reported elsewhere [25]. Thus, the support and the facilitation from a trained dog instructor and the planned procedure using a certified dog contributed to all the children reaching interaction level five and to 44 of 49 children reaching level six.

According to previous studies, children's possibility to interact in health care is often limited [26]. Various obstacles, displayed by healthcare professionals, can influence the child's possibility to be involved in interaction in hospital care [26–28]. The use of unclarified medical jargon [26,28] and a tendency to turn to the child's parents instead of to the child in issues concerning the child's illness or treatment leads to the child being excluded from the interaction [27]. Healthcare professionals' education and competence can contribute to involving children in their interaction in dialogues [26]. Other studies show how interaction with a dog can facilitate communication and interaction between healthcare professionals and children at hospital [11] as well as increasing children's emotional and social functions thereby leading to a higher sense of wellbeing in children with chronic disorders and physical dysfunctions [10]. In this study, we show that strong interaction between child and dog is independent of the child's health condition, other treatment or maturity. Guidance in structured AAA with a dog could be an opportunity for children to have control over their situation during the session and thus experience self-confidence, empowerment and wellbeing. Some similarity can be seen to guided imagery, where the child is guided in non-pharmacological strategy to reduce anxiety and pain and increase well-being [29]. The children in the present study presented various reactions to the dog interaction such as happiness, joy, comfort and peacefulness, but also fear of the dog. In those situations which occurred at the beginning of the AAA, the dog instructor played an essential role by bridging and facilitating the children's understanding of the dog. The importance of explaining emotions, acting responsively to the child's expressions and promoting the child's engagement are essential to good interaction [24]. Some children verbally expressed positive physical effects of having dog activity e.g., not needing pain relief. These findings are supported in previous studies in which positive effects of AAA/AAT have been reported, such as affecting anxiety and overall well-being [8], dog therapy can ease pain and increase well-being [7] and postoperative

pain decreased after having dog therapy [9]. The parents and other relatives also enjoyed the moments with the dog. The feelings expressed could be interpreted as being a respite of happiness united in the dog therapy during the interaction. A respite from the sometimes tough times of sadness [7], anxiety and fear of painful procedures [2] and the chaos that the hospital stay can represent for the child and their family [30].

4.2. Strengths and limitations

The study's methodology strengths and limitations should be discussed. The sample was randomly selected and included 49 children from 3 to 18 years of age. The lower age-limit was determined by the child's cognitive skills and physical condition based on data collection of physical parameters that will be reported elsewhere. Randomly selecting the participants, and not only inviting those with a positive attitude towards dogs, can be considered to have strengthened the variation in the sample. Nine parents considered their children to be moderately to very afraid of dogs. Even these children reached at least level five in the interaction. That notwithstanding, with a spread of attitudes and age among participants in the sample group in qualitative research there is a risk of not reaching saturation and this can lead to lower reliability of the result. Nevertheless, with a sample of 49 participants this risk is low. Some children with severe conditions were excluded and a risk analysis of the specific ward was carried out together with recommendations for animals in healthcare routines for the study [12]. The activity was an option to voluntarily join treatment in a research setting and a few children declined to participate.

As the observed interactions were made by one person (MLN), there is the risk of subjectivity. However, by following the observation guide, the observations were interpreted similarly which strengthens objectivity. The 49 observations provided rich data. A deductive approach was used for gathering data according to content. Thereafter grouping, coding, categorisation and abstraction in the qualitative content analysis [22]. All data content relating to interaction or non-interaction between child–dog, child–instructor, child–parent or other relative were detected. To assess the children's emotions, it was necessary to perform an interpretation of their facial expressions and body language based on their verbal sounds or words together with their behaviour. Negative emotions that are difficult to recognise, such as fear [19], were interpreted from their body language when the children hurriedly and physically sought out their parents, pushed the dog away or verbally asked e.g., if the dog would bite. The explanation of emotions, if seen as a model of basic emotions that are cross-cultural [19,20] or influenced by the context and cognition ability [31,32] is discussed by researchers [33]. Nevertheless, the literature seems to agree that the interpretation of expressed emotions is necessary for humans' social interaction and survival [32–35]. To avoid interpretation based on preunderstanding the analysis was performed close to the written text with careful consideration of the latent content, such as facial expression and body language as described in the written field notes. Citations from the field notes were included to illustrate and strengthen the findings. A close discussion between the authors took place throughout all analysis of the field notes leading to the final results which strengthens credibility [36]. Transferability to a similar context is up to the reader to determine [36].

5. Conclusions

Structured AAA with three parts of interaction: introduction, active part and relaxing part, can provide deep interaction between a child and a dog in paediatric hospital care. At interaction levels five and six, the children could display positive experiences and various positive emotions. Further, the interplay could empower the children through making them capable to make decisions in a comfortable manner with the companionship of a certified dog, guided by a trained dog instructor. This study can form part of a framework for establishing AAT/AAA with

a dog in paediatric health care. Further studies to explore and investigate how to perform AAT/AAA safely and studies to detect which children benefit the most from the activity can guide the implementation of the complementary treatment in paediatric healthcare.

Ethical approved

The Regional Ethical Review Board in Uppsala, Sweden (Ref no 2014/167) approved the study and the procedure.

Author statement

All authors declare that the paper has not been published and is not being considered for publication elsewhere. The publication are improved by all authors.

Declaration of competing interest

No.

Acknowledgement

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ctcp.2023.101807>.

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