

Case Report

A model of child life intervention to facilitate effective coping in a child hospitalized for heart surgery

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Practice Points

- This case study illustrates the effectiveness of providing child life intervention to a 7-year-old child hospitalized for heart surgery.
- The evaluation of the intervention provided during the period of hospitalization includes preparation and therapeutic play focusing on: clarification of misunderstandings of medical experiences; provision of age-appropriate information regarding the reason for hospitalization and anticipated treatment; supporting effective communication between the child and caregiver through parental involvement in psychoeducational preparation; and self-report and observational data obtained for distress and coping behaviors, anxiety, emotional well-being and perception of intervention effectiveness before and after the child life intervention.
- The data shows reduced levels of noncompliance and disruptive behavior demonstrating the effectiveness of the intervention in reducing stress associated with misinterpretation of hospital experiences and ineffective child–caregiver communication.
- Evidence for the effectiveness of child life intervention and recognition of hospitalization as a traumatic event that can disrupt development and family functioning will facilitate the development of child life services as part of a multidisciplinary medical service.

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SUMMARY This case study illustrates the effectiveness of providing developmentally appropriate medical information to a 7-year-old child hospitalized for heart surgery. The intervention involved support during medical procedures and educational and therapeutic medical play to enhance information processing during a medical encounter. Self-report and observational data was obtained for distress and coping behaviors, anxiety, emotional well-being and perception of intervention effectiveness before and after the child life intervention. The data shows reduced levels of noncompliance and disruptive behavior, demonstrating the effectiveness of the intervention in reducing stress associated with misinterpretation of hospital experiences and ineffective child–caregiver communication.

Child life (CL) specialists play an essential role in promoting child- and family-centered care in pediatric settings. They employ a systemic approach to address the psychosocial concerns of hospitalized children and families based on a mutually beneficial partnership among patients, families and providers that recognizes the importance of the family in the patient's life.

A key part of a CL specialist's role is to prepare children for medical procedures. The primary goals of preparation are twofold: to reduce the fear and anxiety experienced by a child in the short term and to promote long-term coping and adjustment to future healthcare challenges. Participating in a CL program has been shown to enhance mood [1] and significantly reduce the anxiety experienced by children before and after procedures, as well as at 1 month follow-up [2,3].

In North America many hospitals offer a surgical preparation program to children and families, yet minimal research has been conducted to explore the costs and benefits associated with these programs [2]. Existing research in this area primarily employs quantitative methods and rarely includes participants from diverse cultural backgrounds. Yet qualitative research may be better suited to exploring the complex processes associated with pediatric preparation [101].

The essential elements of preparation are the provision of developmentally appropriate information and the encouragement of emotional expression [101].

In providing developmentally appropriate information to children, the emphasis should be on clear, accurate messages covering relevant topics such as coping techniques [101]. Encouraging emotional expression facilitates the identification of misconceptions, potential stressors

and fears to be addressed during preparation procedures.

Recognizing that communication is a transactional activity is especially important in CL as the emotionally charged climate of the healthcare setting can magnify the effect of verbal and nonverbal exchanges [4]. Clinicians should be mindful that nonverbal signs are open to misinterpretation and even verbal communication can have varied meanings; the words we use may not mean the same thing to another person as they mean to us [5]. An example, offered by Klinzing *et al.*, is that the word 'hospital' may frighten a child due to associations with fear-provoking instruments and needles, while it is simply a workplace for healthcare professionals [4]. In certain contexts words can be incredibly powerful and can generate images and emotions with such intensity that they may replace reality [6]. Accordingly, it is necessary to test which words elicit fear for an individual and to explore the child's understanding of these.

In the case study reported here, the authors illustrate how medical jargon stimulated fears and noncompliant behavior in a 7-year-old, Luka (pseudonym), hospitalized for heart surgery. The case was conceptualized according to an information processing and stress appraisal model [7]. This model describes how a child processes information and makes stress appraisals in an unfamiliar, threatening situation. According to the model, being in a situation with little or no information available leads to a state of high uncertainty regarding the nature of the threat and what might be done about it. High uncertainty leads to low perceived control over the situation. This combination of low information and perceived control with high levels of uncertainty contribute to a high threat appraisal and emotional distress. The

authors also describe in detail the contextual and transactional variables that are proposed to affect each phase of the cycle of information processing and appraisals (Figure 1). These variables include, but are not limited to, type of procedures, age, temperament, parent's communication, responsiveness, expectation, perception and anxiety level [7]. Considering how these variables affect the stress appraisal process may improve our understanding of information processing in this context.

In the complex and dynamic process of coping with stress, some strategies could be counter-productive or prolong the stressful situation. CL specialists have the opportunity to affect the coping process on both levels: primary appraisal (am I in trouble?) and secondary appraisal (how can I cope with this?) by making the process less threatening through the provision of accurate information about the potentially stressful situation, and by practicing and implementing strategies [8].

This case study describes the importance of a CL intervention in enhancing information processing during a medical encounter. In order to fully explore the many interacting factors operating during the intervention process, a qualitative approach was employed. The following evaluation of the intervention provided during the period of Luka's hospitalization includes preparation and therapeutic play focusing on:

- Clarification of misunderstandings of medical experiences;

- Provision of age-appropriate information regarding the reason for hospitalization and anticipated treatment;
- Supporting effective communication between the child and caregiver through parental involvement in psychoeducational preparation.

Method

Setting

The CL intervention was provided to Luka for the duration of his stay at the JoAnn Medical Center (Tbilisi, Georgia). The JoAnn Medical Center is a 20-bed tertiary pediatric center that provides residential care during cardiac surgery to the Caucasus region. The CL service is available to all hospitalized children and their families on a regular basis.

During his 9-day period of hospitalization, Luka spent 2 days in an inpatient cardiac department prior to surgery, 2 days in a cardiac intensive care unit (CICU) and 5 days in a cardiac unit after surgery. Luka's mother was available to participate in the intervention during the entire hospitalization. Luka's father, as a working parent, made limited visits to the hospital, but was involved in educational sessions and interventions during the first 2 days.

History

Luka is a Georgian-speaking first-grade student from a Georgian family. He is an only child and lives with his parents and grandparents. His mother describes him as a difficult child with a

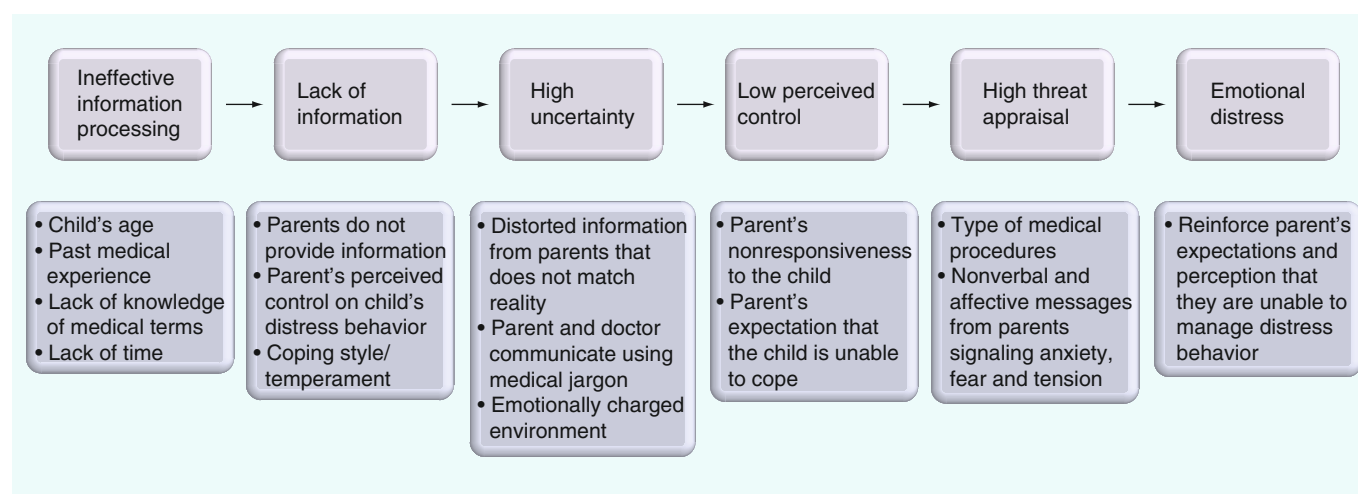


Figure 1. Role of contextual and transactional variables in ineffective information processing.

Adapted from [7].

quick temper. She reported a previous healthcare encounter, involving dental procedures, in which Luka was extremely difficult to handle from his parents' perspective. He has no previous history of hospitalization.

■ Procedure

Ethical approval was obtained from the local ethics committee. The intervention and associated measures described in the following section are routinely administered to children referred to the CL service.

The CL intervention procedure was implemented in three phases across the period of hospitalization: introduction, initial and ongoing assessment, and intervention (Table 1). Verbal and written consent were obtained from the parents and child prior to observation and intervention. This information was simplified to an age-appropriate level for the child.

During the introduction phase rapport was established between Luka, his family and the CL specialist. Information about Luka's medical history, past hospital experiences, family and child coping style and an account of how much information had been shared with Luka regarding health issues and treatment was obtained from his parents, nurses and the cardiologist.

During the intervention phase, Luka was provided with sessions by a CL specialist two- or three-times each day. All interventions were provided by a single CL specialist (other hospital specialists provided records of Luka's behaviors but were not aware of the aims of this study).

Sessions lasted approximately 1 h. The intervention was implemented through therapeutic medical play including education about his health condition, preparation for procedures and support during stressful procedures. Medical play is an essential intervention, including spontaneous and guided play with medical equipment that focuses on the anticipated procedures [9]. The objectives of medical play are to become familiar with sensory experiences, make events predictable, show how to be actively involved in procedures and to select a distraction activity. Despite the painful nature of the procedures concerned in this case, measures to prevent and treat pain were not part of the intervention as topical anesthetic is not used prior to needle insertion for venipuncture.

Preoperational medical play aimed to help Luka become more familiar and comfortable

with healthcare equipment and procedures. This particular aspect of the hospitalization period was identified as stressful for the child by the CL specialist and parents.

The first 2 days involved preparation for the anticipated procedures as well as observations of the child and parents' behavior (both before and after interventions) during blood tests, echocardiograms and routine check-up procedures. Also, two educational sessions were provided to explain his diagnosis and the reason for hospitalization in an age-appropriate manner (Figure 2). The parents were present and participated in both preparation and educational sessions. The parents were provided with educational sessions regarding the importance of preparation and the use of age-appropriate explanations for children.

After surgery, CL support in the form of a premedication process was provided to Luka while on a general ward and in CICU. The premedication was conducted with both parents present where possible. However, visitor restrictions were in place in CICU, therefore CL support was provided when the parents were not present if sessions occurred outside of these hours. Sessions included age-appropriate bedside activities selected by the child. Preparation for removing the chest tubes was also conducted during this period and emotional support was provided accordingly.

The subsequent sessions following these CICU play activities involved postprocedural medical play and art activities conducted in the CL play area. Postprocedural medical play offers an opportunity to express subsequent emotions and concerns through the reenactment of experiences [7].

Human figure drawing

Drawings that Luka produced while in hospital were used to assess his emotional well-being. He was asked to draw himself on his first day of admission to the hospital and again on the sixth day before being discharged. According to Skybo *et al.* differences in human figure drawings (HFDs) over time can reveal changes in coping with a stressful life event [10]. Luka was also asked by the CL specialist to describe his drawing to encourage verbalization of emotional or cognitive appraisals at that time. His self-drawings were evaluated using the HFD method by the researcher (K Dolidze) [11].

Table 1. Description of child life interventions.

Type of intervention	Materials	Aim of intervention	Description of intervention and Luka's and his parent's feedback
Orientation	Toys and games	To establish trust To decrease anxiety To normalize hospital experience	Building rapport during a tour of the hospital Encouraging to play with CL specialist in play area
Assess Luka's emotional status	Crayons, paper	–	CL specialist asked Luka to “Draw yourself and tell me the story” When describing Figure 3 Luka said that the boy was afraid of the monkey and trying to escape from him. This led to a role play activity to explore this idea of the monkey. During this, Luka revealed that the monkey made the boy ill. The specialist asked directly “Do you know why you are in hospital?” Luka nodded his head and answered “I have monkey.” (In Georgian, congenital defect sounds like ‘monki’, a term unfamiliar to Luka. It seems he understood it to mean the English word ‘monkey’)
Educational sessions: explain the diagnosis and reason for surgery	Coloring and activity book <i>Taso visits the Cardiologist</i> [23]	To explain the reason for hospitalization To correct the misunderstanding of his health condition	CL specialist used age-appropriate resources (activity book; Figure 2) to explain how the heart works, what happens when a hole exists in the septal wall, and how it is the surgeon's job to mend this hole
Medical play/ preparation for potentially stressful procedures, venipuncture, premedication, surgical treatment, removal of chest tubes and epicardial electrodes, incision care	Medical play kit including anesthesia mask, gloves, masks, syringes, central line catheter, cannula, butterfly needles, cotton balls, doctor bonnets, spirometer, electrodes, doll with chest tubes, blood pressure cuff, stethoscope, tape and bandaging, coloring book <i>Taso Goes to Heart Clinic</i> [24]	To aid understanding of procedures To decrease anxiety To increase compliance during procedures	Attended by Luka's mother. Luka was told that the play helps him understand the procedures. CL specialist reported that it took time to engage in medical play and initially he cautiously observed before investigating the materials. CL specialist demonstrated the procedure step-by-step on the doll, describing in terms of sensory experiences. Luka (as well as his mother) was encouraged to ask questions and express feelings
Support during procedures (in CICU and cardiac unit)	–	To decrease anxiety To facilitate coping	Luka asked CL specialist to assist during procedures. CL specialist provided Luka with ongoing explanation about the progress of the procedure. CL specialist reported that Luka used better coping procedures after CL intervention and mainly demonstrated coping behaviors rather than distress behaviors; he sought information regarding anticipatory tasks that enabled him to cooperate. Medical staff also observed an increase in compliance as well as finding the mother more supportive and responsive to Luka
Medical play/ postprocedural therapeutic play	Medical play kit including syringes with needles, catheters, tape, butterfly needles, blood pressure cuffs, band aids mask, stethoscope, hospital bed and cloth doll	To offer opportunity to recreate experiences associated with stressful medical procedures in a nonthreatening environment	Main theme of medical play was venipuncture and surgery. Length of play was on average 20 min several times a day

CICU: Cardiac intensive care unit; CL: Child life.
Data taken from [23,24].

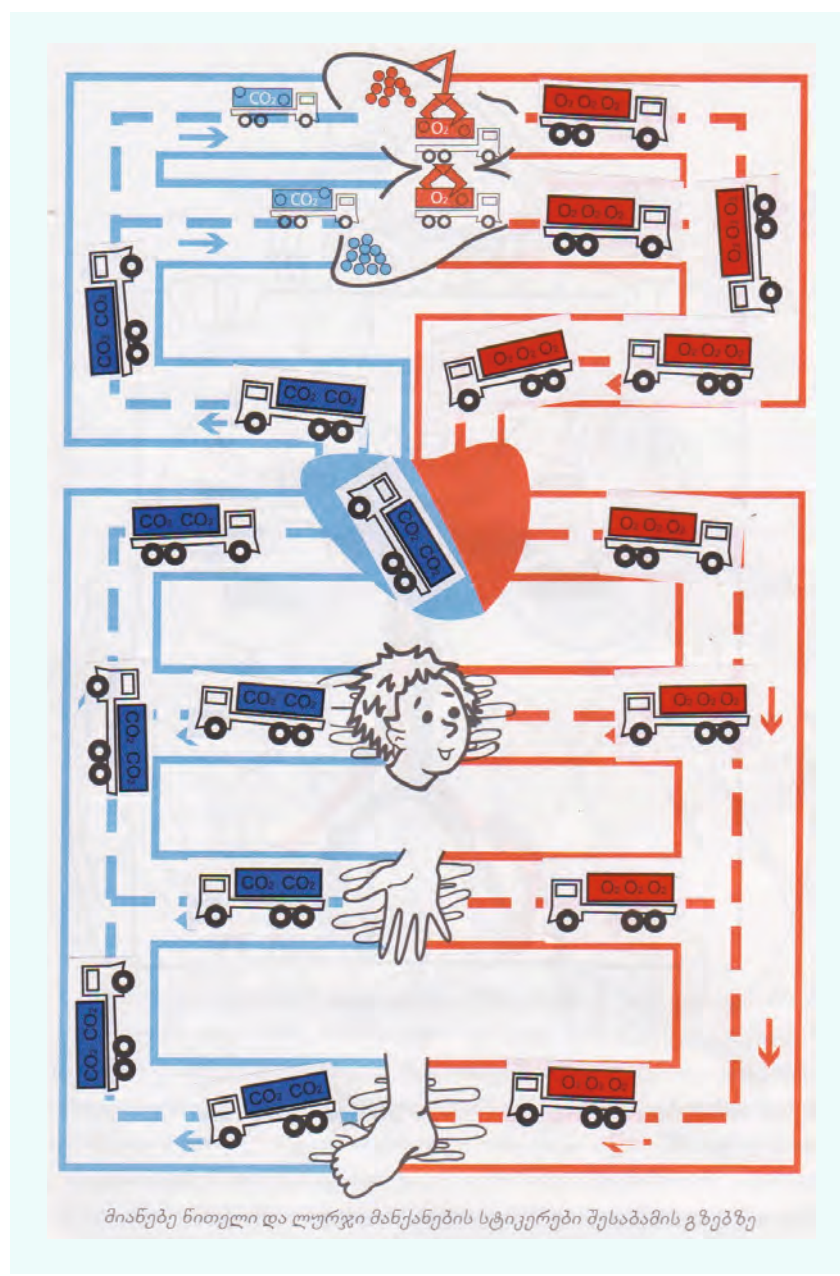


Figure 2. Educational material from coloring book *Taso Visits the Cardiologist* to explain how different parts of heart works and blood circulates.

Reproduced with permission from JoAnn Medical Center, Tbilisi, Georgia.

Pre- and post-surgical self-drawings were compared for content, quality and emotional indicators including the depiction of different body parts and use of colors. This analysis was based on the assumption that differences identified between hospitalized children for heart surgery and control participants in both pre- and post-surgical drawings highlight the importance of providing continuous support during the entire hospitalization [12].

■ Measures

Where possible, psychometric properties reported in the literature are provided. Properties are not calculated for the data presented here as this is a single case study.

The Child–Adult Medical Procedure Interaction Scale

The Child–Adult Medical Procedure Interaction Scale (CAMPIS-R) was used to assess child coping and distress, as well as adults' behaviors displayed in the procedure room. This reflects research reporting that child medical treatment occurs in a social context, which influences the child's level of distress and coping [13]. The CAMPIS-R comprises six categories: three categories of child behavior including distress, coping and neutral, and three for adult behavior including distress promoters, coping promoters and neutral. This scale mainly quantifies behaviors displayed during medical procedures without referring to the specific emotional content.

The rate of CAMPIS-R behaviors was recorded as frequency of coded behaviors per minute. This scale is reliable with inter-rater reliability values ranging from 0.65 to 0.92 assessed using Cohen's kappa [13]. The CAMPIS-R has been shown to be sensitive to therapeutic effects, demonstrated by changes in CAMPIS-R distress, coping, distress promoting and coping promoting scales following intervention [13,14].

Luka's behavior and his interaction with his parents during admission procedures were blind rated by CL staff members using the CAMPIS-R. The observation before and after the CL intervention was provided by two different people: CL assistant (before) and nurse (after intervention). Both received the same training that will ensure inter-rater reliability to some extent. It was employed to measure the outcome of preparation during five procedures identified by the CL specialist and parent as potential sources of stress and pain: venipuncture, check-up procedures (during admission and hospitalization period), echocardiogram, premedication and removal of epicardial wire electrodes and chest tubes.

State-trait anxiety inventory

The state-trait anxiety inventory (STAI) was used to assess the anxiety level of the main caregiver who assisted during the procedure (Luka's mother) at the time of Luka's admission.

Internal consistency coefficients for this scale range from 0.86 to 0.95 and reliability coefficients range from 0.65 to 0.75 over a 2-month interval [15].

Parent's perception of effectiveness of preparation

Luka's parents' perception of the helpfulness of preparation sessions was recorded on a five-point Likert scale (1: not at all helpful, 5: very helpful). Luka's mother completed a paper survey including two questions:

- How helpful did you find the preparation session?
- How helpful was the preparation session for your child?

This was initially administered after preparation sessions for venipuncture and premedication procedures and again after these procedures had taken place.

Posthospital behavior questionnaire

Postdischarge behavioral changes were assessed by the Post Hospital Behavior Questionnaire (PHBQ). This is a validated 27-item questionnaire that measures the occurrence of maladaptive behaviors after hospitalization within six categories: anxiety, separation anxiety, sleep anxiety, eating disturbances, aggression against authority and withdrawal [16]. Two weeks after discharge a CL assistant administered this structured questionnaire during a telephone interview with Luka's mother. She was asked to assess the change in Luka's behavior for each item as "much less than before", "less than before", "same as before", "more than before" or "much more than before". An adverse behavior change was defined as any behavior reported by the parent as occurring "more than before" according to the PHBQ manual [16].

Results

■ Background information

Luka was referred to the CL service by a cardiologist, due to signs of elevated anxiety, both in Luka and members of his family, and non-compliance during admission procedures. His parents also expressed concerns regarding how to inform Luka about the surgical procedures. Following his diagnosis of ventricle septal defect, the decision to undergo surgical treatment was made by the parents in a short period of time,

causing anxiety and disruption in normal family functioning. The planned treatment was initially concealed from Luka. His parents requested that medical personnel avoid overt communication regarding the surgery, explaining that "the management of Luka's behavior would be difficult". This account highlights the exclusion of Luka from decision-making processes and draws attention to the need for family-centered care, involving all members of the family.

■ Initial assessment

The CL specialist and parents identified potential sources of stress for Luka including: anticipated procedures such as blood tests, premedication/venipuncture, removal of epicardial electrodes and chest tubes, incision care and separation from his parents while in CICU.

■ Measures CAMPIS-R

Data collected before and after the CL intervention are presented in [Table 2](#).

Certain procedures were administered during the admission period before Luka's referral to the CL department (echocardiogram, check-up procedures and venipuncture). During these procedures Luka and his mother showed high anxiety and distress-promoting behaviors including (scores in parentheses): criticism (5), overly reassuring comments (3) and giving control to the child (3) for the mother; and crying (4), screaming (2), verbal expression of pain (4) and verbal resistance (7) for the child. After the intervention, child distress behaviors were diminished and coping behaviors were observed, especially on the fifth day of hospitalization. During the final days of hospitalization Luka felt able to attend the procedure room without the assistance of his mother. She appeared to accept this choice as a positive sign of increased independence.

STAI

According to the STAI, the anxiety level of Luka's mother was high (69) on the first day of hospitalization.

Parent's perception of effectiveness of preparation sessions

For the venipuncture preparation (during the first day of hospitalization) Luka's mother assessed the helpfulness of preparation, for both her and her child, as 4 increasing to 5 after the procedure.

Table 2. Child-Adult Medical Procedure Interaction Scale data before and after child life intervention during venipuncture, echocardiogram and routine check-up procedures.

CAMPIS-R	Venipuncture		Echocardiogram		Routine check-ups	
	Before CLI (day 1)	After CLI (day 1)	Before CLI (day 1)	After CLI (day 5)	Before CLI (day 1)	After CLI (day 5)
Procedure duration (min)	10	5	20	15	10	10
AN behaviors						
Nonprocedural-related talk to adults	2	0	2	1	4	n/a [†]
Procedure-related talk to adults	0	1	1	3	4	n/a [†]
Command to engage in procedural activity	0	0	0	0	0	n/a [†]
Behavioral commands to the child	3	0	0	0	3	n/a [†]
Commands for managing child's behavior	1	0	0	0	0	n/a [†]
Praise	0	1	0	0	0	n/a [†]
Adult DPs						
Criticism	5	0	4	0	0	n/a [†]
Reassuring comment	3	0	3	0	0	n/a [†]
Giving control to the child	3	0	0	0	0	n/a [†]
Child CBs						
Nonprocedural-related talk by the child	0	0	0	1	0	1
Humor by the child	0	0	0	0	0	1
Child DBs						
Crying	4	0	3	0	0	0
Screaming	2	0	0	0	0	0
Verbal resistance	7	1	5	0	1	0
Verbal pain	4	1	1	0	0	0
Information seeking	0	2	0	0	1	1
Verbal emotion	0	0	2	0	0	0

Numbers reported represent the total frequency of coded behavior.

[†]Child was in procedure room for routine check-ups (incision care) without caregiver.

AN: Adult neutral; CAMPIS-R: Child-Adult Medical Procedure Interaction Scale; CB: Coping behavior; CLI: Child life intervention; DB: Distress behavior; DP: Distress promoter.

For the premedication procedure (during second and third day of hospitalization) she estimated the helpfulness of preparation as 5 before and 4 after the procedure.

PHBQ

The PHBQ data collected 2 weeks after discharge produced a total score of minus five. The summary scores theoretically range from -54 to +54 with positive scores indicating maladaptive behavioral change. Thus the near neutral score suggests that Luka did not demonstrate maladaptive behavior change.

Discussion

Luka and his parents were referred to a CL specialist following elevated levels of distress during admission procedures and concern expressed by his parents regarding how to inform Luka about the surgery. It is worth noting this reason for

referral as certain aspects of the case may be specific to individuals presenting with anxiety rather than typical 7 year olds. Healthcare professionals reported extremely high levels of anxiety displayed by his parents, corresponding with his mother's self-reported anxiety levels. Both parents had an accurate understanding of the diagnosis and reason for hospitalization; however, they felt unable to explain this to Luka because of fear that "this information will further escalate his anxiety" compounded by a lack of knowledge regarding how to provide "this extremely stressful information in a nonthreatening manner". Luka was assessed by a CL specialist and received interventions based on educational and therapeutic medical play as well as support for both Luka and his parents during medical procedures.

Figure 1 demonstrates how contextual and transactional variables can influence stress appraisal and information processing resulting

in high emotional distress. Luka's only sources of information were: distorted information from his parents (that did not match the reality of his experiences); and indirect verbal and non-verbal communication between his parents and healthcare professionals. Furthermore, his age, knowledge of medical conditions and emotional vulnerability are likely to have influenced his ability to process information. Unfortunately, due to time constraints, a cognitive assessment was not undertaken. However, developmental psychology researchers have described the typical level of understanding of a child of Luka's age. During the concrete operational stage of cognitive development children understand illness in terms of contamination and internalization, that is, the cause of illness is an external object that is harmful for the body and the illness itself results from the internalization of this external cause by swallowing or breathing [17,18]. Seven-year-old children also classify procedures according to function, and are able to understand sequential changes in health status if explained beforehand but may have misunderstandings due to literal understanding of words [19].

The combined impact of both the child and parents' behaviors on their distress levels was evident before the intervention, demonstrated by noncompliance and distress behaviors on Luka's part, seen during admission procedures and ultimately resulted in the interruption of venipuncture. In contrast, comparisons with both child and adult behaviors after the intervention indicate that systematic preparation facilitated coping despite high levels of emotional distress. Clinical data collected before and after the intervention demonstrate the importance of parental involvement in psychoeducational preparation in order to reduce anxiety, and to modify ineffective communication between the child and caregiver. For example, after the intervention associated with the venipuncture procedure, the adult displayed coping promoters that were followed by an increase in coping behaviors from the child.

The self-drawing method was very useful in clarifying Luka's level of understanding and identifying his misconception of his health problem. Luka's self-portrait and verbal description provided an insight into his emotional well-being, in particular the fear caused by having an unexplained health condition (see [Table 1](#) for more detail). The following section will outline the HFD analysis, supported by

references from the projective drawing literature, and explain how this information was applied to interventions with Luka.

In a study comparing the drawings of children hospitalized for heart surgery to nonhospitalized children, qualitative statistical analysis revealed significant differences [12]. Specifically, a significant number of drawings produced before surgery omitted the arms, a feature of Luka's first self-portrait ([Figure 3](#)). According to the HFD literature [20], omitted arms may represent anxiety and guilt. The hands have been described as a representation of the ability to take action or defend yourself [21], thus a lack of arms may reflect feelings of helplessness.



Figure 3. Luka's self-drawing produced on admission.

Luka also omitted his neck, which could be interpreted as a sign of impulsivity and poor inner control, observed in more than half of the presurgery drawings in a previous study [12]. Shaded areas of the body, in Luka's case the torso, have been proposed to represent an area of specific concern and anxiety [20]. This has face validity as it corresponds to the site of Luka's surgical treatment.

The drawings and provisional interpretations were used as discussion points during interviews with Luka. When describing his drawing (Figure 3), he said that this boy was afraid of the monkey and was trying to escape from him. In role play it became clear that Luka believed that the monkey caused the boy's illness. When asked "Do you know why you are in hospital?" he

nodded and replied "I have monkey". In Georgian the congenital defect sounds like "monki." Luka did not know this term, but he was familiar with the English word monkey so literally understood his health condition as a monkey.

Luka is likely to have based this assumption on information from the hospital environment, distorted messages from direct conversations with his parents and indirectly from the communication between doctors and his parents. In the transactional process of communication, Luka's non-compliant behaviors are likely to have strengthened his parents' feeling that they are unable to handle his negative emotions and behaviors, providing confirmation for their decision to conceal information about planned procedures. However, participating in the CL intervention sessions that employed the self-drawing technique enabled the staff and family to understand the motivation behind Luka's behavior, and subsequently to reassure him by rectifying his misunderstanding.

The results of behavior observation in the period after systemic CL intervention show positive changes in adjustment and effective coping, which are corroborated by suggested interpretations of emotional indicators identified in Luka's second self-portrait (Figure 4). He drew an umbrella in one hand and explained "I found the umbrella here to protect me from rain". In his first drawing, Luka drew himself on a slant omitting the ground. In the second drawing this changed to a figure standing with one foot on the ground. Also, his initially darkly shaded torso changed to a blue colored one. In a previous study, the only significant difference between pre- and post-heart surgery drawings of hospitalized children was in the use of the color blue [12]. The authors suggest that greater use of blue in drawings created after surgery could be interpreted as better emotional balance [22].

Furthermore, in terms of adverse behavior after discharge, no changes were reported by Luka's mother except for mild eating disturbances.

This case study demonstrates the effectiveness of CL intervention in reducing behavioral stress associated with misinterpretation of hospital experiences and ineffective child-caregiver communication. It supports the importance of CL intervention as a valuable element of pediatric care and highlights a helpful strategy for the daily management of psychological stress in young children going through a stressful medical encounter. Single case studies allow us to



Figure 4. Luka's self-drawing produced after receiving child life intervention and undergoing surgery.

describe and reflect in detail as well as promoting development of future strategies to improve assessment and intervention.

Limitations of study

One of the limitations of the current case study is that the parents' anxiety levels were only collected at a single timepoint (before the intervention). Due to the short time frame, researchers did not have the opportunity to collect post-intervention scores, which would have served as a way to differentiate between an effective intervention (if anxiety scores reduced) and the possibility that parents and/or child just became more familiar with the hospital procedures (if scores did not reduce).

Secondly, projective techniques are hard to interpret due to their subjective nature. The authors emphasize that this is an intervention technique that can be helpful in identifying significant themes, which should then be discussed further with the child. It is important that the reader understands that drawings should not be overinterpreted, rather they represent a starting point for role play or conversations exploring ideas that arise. Finally, the intervention process was continuous and provided several times a day, which is unlikely to be the case in most clinical services.

Implications for future research

Despite these limitations of this case study, it nonetheless makes a useful contribution to the literature and the benefits of this are twofold: for research purposes, this leads to further investigation in the form of case series studies; clinically, it results in more systematic structured

interventions aiming to diminish child and family stress and empowering them as integral members of the healthcare team.

In the context of procedural preparation, further research is needed to investigate the child's perception of preparation and psychoeducation with particular emphasis on the association with cognitive development.

Future perspective

Having the best evidence regarding the effectiveness of CL interventions and recognizing hospitalization as a traumatic event that can potentially disrupt a child's development and family functioning will benefit CL services as part of a multidisciplinary medical service. CL specialists represent a profession who understand the unique and distinct needs of children of all ages and their families, when experiencing stressful medical circumstances that have negative effects on their well-being and future health experiences.

Informed consent disclosure

The author's state that they have obtained verbal and written informed consent from the patient for the inclusion of their medical and treatment history within this case report.

Financial & competing interests disclosure

The authors have no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.

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