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Child Life Specialists Decrease Procedure Time, Improve Experience, and Reduce Fear in an Outpatient Blood Drawing Lab (CLS Decrease Procedure Time)

Kirsten Getchell, MS, CCLS[1], Kate McCowan, MS, CCLS[1], Erin Whooley, MS, CCLS[1], Christine Dumais, EdM, CCLS[1], Addie Rosenstock, MS, CCLS[1], Alexandra Cole, MPH[1], and Michele DeGrazia PhD, RN, NNP-BC, FAAN[2,3]

Abstract

Children can experience extreme fear when undergoing medical procedures, including blood draws. A growing body of evidence points to the benefits of Child Life Specialists supporting children throughout medical procedures in various medical settings. This prospective cohort study aimed to describe the impact of Child Life Specialist facilitated play on children's fear and caregiver satisfaction in an outpatient blood drawing lab. A nonrandomized convenience sample of 150 children and their caregivers were enrolled. Seventy-five patients received the Child Life Specialist intervention during their blood draw, while the remaining 75 patients were enrolled as controls. Children and caregivers in the intervention group spent less time in the procedure room, with a median time of 3 min (interquartile range: 2-5) as compared to 5 min (interquartile range: 5-6; $P < .001$) for the control group. Caregivers in the intervention group reported the atmosphere ($P = .032$) and experience ($P < .001$) more positively, and children reported lower fear scores ($P = .007$) as compared to the control group. The findings of this study suggest that Child Life Specialist interventions in pediatric outpatient blood drawing labs improve satisfaction and reduce fear.

Keywords

child life, phlebotomy, patient experience, fear, patient satisfaction

Introduction

Providers who deliver pediatric care rely heavily on results obtained from blood samples taken in outpatient blood drawing labs. However, children and their caregivers (parents, guardians, or others responsible for the child's care) report that children not only experience extreme fear when having blood drawn by venipuncture but that this fear can lead to dissatisfaction with the care they receive (1, 2). This experience in outpatient blood drawing labs can also influence the child's future health care encounters (3).

Literature suggests that Child Life Specialist (CLS), professionals trained in child development, family systems, and evidence-based supportive interventions, can positively affect the child and caregiver experience in the healthcare milieu (4). CLS create desirable child and caregiver experiences, impacting psychosocial outcomes for the betterment of children (5). CLS are an essential part of the multidisciplinary healthcare team, collaborating to meet the needs of the children, caregivers, and the staff they serve in various settings (6, 7). In their most recent position statement, the American Academy of Pediatrics recommends that providers determine the effects of CLS on patient and family satisfaction (7).

[1] Boston Children's Hospital, Boston, MA, USA
[2] Neonatal Intensive Care Unit, Boston Children's Hospital, Boston, MA, USA
[3] Harvard Medical School, Boston, MA, USA

Corresponding Author:
Kirsten Getchell, Boston Children's Hospital, 300 Longwood Ave., Boston, MA 02115, USA.
Email: kirsten.getchell@childrens.harvard.edu

Studies show that procedure time and number of staff during a procedure often decrease when nonpharmacological interventions are utilized (8, 9). CLS use nonpharmacological interventions (tools) such as preparation and distraction to help their patients cope with fear. Their developmentally appropriate preparation materials include pictures or coloring books, tours, medical play, teaching dolls, board games, art drawings, and relaxation or coping exercises (10). CLS also use behavioral distraction techniques such as assorted visuals, breathing techniques, comfort measures, and diversional talk to provide children and caregivers a sense of control when they rehearse before a procedure. This preparation and education of children and caregivers for various procedures can have a positive or beneficial impact on understanding, anxiety, and satisfaction (11–13).

In 2015, a CLS was recruited to prepare and support children and their caregivers in the outpatient blood drawing lab within a large urban pediatric healthcare center. This was the first time a CLS was permanently positioned within the lab. The purpose of this study was to describe the CLS' impact on the child's fear and caregiver satisfaction in the lab. This study aimed to compare the child's fear and caregiver satisfaction when children ages 5 to 12 years received CLS facilitated play compared to when they did not receive CLS facilitated play.

Methods

Setting and Sample

This single-center prospective cohort study was conducted in the outpatient blood drawing lab located within an urban free-standing quaternary care 404-bed academic children's hospital in the Northeastern United States. A nonrandomized convenience sample of English-speaking caregivers with developmentally appropriate children aged 5 to 12 years was enrolled. Half of the children were enrolled during the hours when the CLS was present. The remaining children were enrolled when the CLS was absent from the lab.

Human Subjects

The medical center's scientific review committee and Boston Children's Hospital Institutional Review Board approved the study (IRB-P00025170). Children and caregivers from both the intervention and control groups who completed all study requirements received a gift card of $20 as a token of appreciation for their participation.

Procedures

Before initiating the study, all study team members and outpatient blood drawing lab staff received education about the study's purpose, aims, and relevant study procedures.

English-speaking caregivers of developmentally appropriate children aged 5 to 12 were informed of the study when entering the lab. If the caregivers and their children agreed to learn more about the study, the research assistant (RA), who was not blinded to study group assignment, reviewed the study, and obtained verbal consent. Verbal assent was ascertained from children 7 to 12 years of age. The control group was consented and enrolled when there was no CLS coverage in the lab, and the intervention group was consented and enrolled when a CLS was present in the lab.

Following enrollment of the control group participants, the RA, child, and their caregiver remained in the waiting room until the laboratory administrator called their name. When the child's name was called to have their blood drawn, the RA observed the caregiver and child throughout the blood draw. Following enrollment of the intervention group, the RA observed the child and caregiver as they met with the CLS while in the waiting room. The CLS encouraged the child to participate in medical play and preparation using teaching dolls, books, pictures, and diversional activities while waiting for his or her blood draw. In addition, the CLS identified and rehearsed coping strategies to use with the child during the blood draw. The CLS and RA accompanied the child and caregiver to the procedure room to have their blood drawn. Prior to leaving the procedure room, the CLS helped the child cope and recover from the blood draw using play.

For both study groups, the RA recorded the patient wait time between the time of arrival to the lab and being called into the procedure room, time spent in the procedure room, and whether the child needed an adult to restrain them during the blood draw on the Case Report Form. Following the blood draw, the RA administered the Children's Fear Scale (CFS) to the child. They also provided the caregiver with a Patient Satisfaction and Experience Survey, which included questions on their perception of their child's comfort. Following completion of all measures, the family received a token of appreciation for their participation.

Measurement. The CFS was adapted from the Faces Anxiety Scale to measure fear in children undergoing painful medical procedures and was used in this study to measure participants' fear (14). The CFS consists of 5 sex-neutral faces ranging from no fear to extreme fear. The participants indicate which face correlates with how scared they are. In 2011, McMurtry et al. validated the CFS with a sample of 100 children undergoing venipuncture. Test–retest reliability of the child's fear ratings on the CFS was highly correlated immediately following and 2 weeks after the venipuncture event (1). Construct validity of the CFS was also confirmed by comparing CFS fear scores with another validated tool for measuring fear, the Children's Anxiety and Pain Scale, immediately after and 2 weeks following a venipuncture event (1).

The investigator-developed Patient Satisfaction and Experience Survey used in this study included questions that addressed the study aims combined with patient satisfaction surveys used in the phlebotomy and radiology departments. The final survey included 7 questions. A sample of 10 phlebotomy staff members and 5 caregivers tested the

survey to achieve face validity. Feedback from these staff and caregivers ensured the readability of the survey questions and that collected information would reflect caregivers' experiences with their visit to the lab. During the face validation process, one item, #3, was revised for clarity.

Data management. The secure web application REDCap was used for managing the data (15,16). The Patient Satisfaction and Experience Survey was provided to caregivers using the portable tablet. All data were entered directly into REDCap and secured behind the hospital's firewall.

Data analysis. Data were electronically transferred to IBM® SPSS Statistics Version 24 for data analysis. The CFS was used as the primary outcome in the power analysis. The sample size of 150 children provided 80% power to detect a mean difference of 0.69 units in fear between the control and experimental groups (*P*-value of .05). Descriptive statistics were used to describe the sample and both study groups on demographic and clinical characteristics. Comparisons between the control and experimental groups on demographic or clinical characteristics were analyzed using *t* tests and Wilcoxon-Mann-Whitney tests for continuous variables, and χ^2 or Fisher tests for categorical variables.

Table 1. Days and Times of Blood Draws.

	n (%)		
	Control (n = 75)	Intervention (n = 75)	*P* value
Day of Blood Draw			.40[a]
Monday	7 (9.3%)	9 (12.0%)	
Tuesday	34 (45.3%)	23 (30.7%)	
Wednesday	5 (6.7%)	8 (10.7%)	
Thursday	19 (25.3%)	20 (26.7%)	
Friday	10 (13.3%)	25 (33.3%)	
Time of Blood Draw			.009[a]
8:00AM-10:59AM	33 (44.0%)	50 (66.7%)	
11:00AM-1:59PM	24 (32.0%)	10 (13.3%)	
2:00PM-4:59PM	18 (24.0%)	15 (20.0%)	

[a]Fisher exact test.

Results

A total of 150 children and their caregivers participated in the study, with 75 children and caregiver dyads each in the control and intervention groups. Children were enrolled in the study between Monday and Friday between the hours of 8:00 AM and 4:30 PM. Over half of participants from both the control and intervention groups were enrolled between 8:00 AM and 2:00 PM (76% and 80%) and on Tuesdays, Thursdays, and Fridays (83.9% and 90.7%; Table 1).

Time, Number of Individuals in Procedure Room and Needed to Restrain

Findings indicated no statistically significant differences between the control and intervention groups in the mean waiting room times (Table 2). The intervention group spent less time in the procedure room than the control group (a median of 3 min [2,5] vs 5 min [5,6]; $P < .001$). There was no difference in the number of individuals in the procedure rooms when comparing the control and intervention groups. However, more children in the control group required 2 or more individuals to provide restraint during the blood draws compared to the intervention group (84% vs 52%; $P < .001$).

Table 2. Time, Number of Individuals in Procedure Room, and Needed to Restrain.

	Median (IQR)		
	Control (n = 73[a])	Intervention (n = 75)	*P* value
Waiting Time	14 min (7, 23)	12 min (8, 18)	.680[b]
Time in Procedure Room	5 min (5, 6)	3 min (2, 5)	<.001[b]
	Control (n = 75)	Intervention (n = 75)	
# of Individuals in Procedure Room	4 individuals (4, 5)	5 individuals (4, 5)	.156[c]
	n (%)		
3	10 (13.3%)	4 (5.3%)	
4	37 (49.3%)	31 (41.3%)	
5	22 (29.3%)	31 (41.3%)	
6	6 (8.0%)	9 (12.0%)	
	Control (n = 75)	Intervention (n = 75)	
# of Individuals Needed to Restrain	2 individuals (2, 2)	2 individuals (1, 2)	<.001[d]
	n (%)		
1	12 (16.0%)	36 (48.0%)	
2	63 (84.0%)	38 (50.7%)	
3	0 (0%)	1 (1.3%)	

[a]2 missing.
[b]Mann-Whitney *U* test.
[c]Chi-square test.
[d]Fisher exact test.

Table 3. Patient Satisfaction and Experience Survey, and Children's Fear Scale.

	n (%)		*P* value
	Control (n = 75)	Intervention (n = 75)	
Patients who had experienced a previous blood draw			.229[a]
Yes	67 (89.3%)	71 (94.7%)	
No	8 (10.7%)	4 (5.3%)	
Patients who were prepared by caregivers for blood draw[b]			.139[a]
Yes	31 (41.3%)	22 (29.7%)	
No	44 (58.7%)	52 (70.3%)	
Atmosphere in waiting room			.032[c]
Excellent	15 (20.0%)	24 (32.0%)	
Very good	23 (30.7%)	31 (41.3%)	
Good	28 (37.3%)	18 (24.0%)	
Fair	6 (8.0%)	2 (2.7%)	
Poor	3 (4.0%)	0 (0%)	
Wait for blood collection			.415[c]
Much shorter than I expected	18 (24.0%)	20 (26.7%)	
Somewhat shorter than I expected	9 (12.0%)	16 (21.3%)	
Satisfactory, as I expected	29 (38.7%)	27 (36.0%)	
Somewhat longer than I expected	14 (18.7%)	10 (13.3%)	
Much longer than I expected	5 (6.7%)	2 (2.7%)	
Child's overall level of comfort during procedure			.005[c]
Very comfortable	18 (24.0%)	36 (48.0%)	
Somewhat comfortable	19 (25.3%)	17 (22.7%)	
Neither uncomfortable nor comfortable	2 (2.7%)	5 (6.7%)	
Somewhat comfortable	25 (33.3%)	11 (14.7%)	
Very uncomfortable	11 (14.7%)	6 (8.0%)	
Child's overall level of comfort after procedure			.007[c]
Very comfortable	32 (42.7%)	50 (66.7%)	
Somewhat comfortable	24 (32.0%)	19 (25.3%)	
Neither uncomfortable nor comfortable	8 (10.7%)	1 (1.3%)	
Somewhat uncomfortable	6 (8.0%)	1 (1.3%)	
Very uncomfortable	5 (6.7%)	4 (5.3%)	
Children's Fear Scale Response			.007[c]
0: not scared at all	19 (25.3%)	29 (38.7%)	
1	11 (14.7%)	23 (30.7%)	
2	16 (21.3%)	10 (13.3%)	
3	12 (16.0%)	4 (5.3%)	
4: most scared possible	17 (22.7%)	9 (12.0%)	

[a]Chi-square test.
[b]n = 74 for intervention group.
[c]Fisher exact test.

Patient Satisfaction and Experience Survey

There was no difference found between the study groups regarding previous blood draws and the number of children prepared (ie, having discussed what it means to have their blood drawn) by their caregivers for blood draws. More caregivers rated the blood draw waiting room atmosphere as good to excellent in the intervention group compared to the control group (97.3% vs 88%; $P = .032$). No differences in the perception of waiting room time between the control and intervention groups were found. The intervention group's caregivers rated their child as very comfortable or somewhat comfortable during the blood draw (70.7% vs 49.3%; $P = .005$) and after the blood draw (92% vs 74.7%; $P = .007$), which was significantly better when compared to the control group. Additionally, more caregivers in the intervention group as compared to the control group reported their child's experience as much better or better than expected (85.3% vs 45.4%; $P < .001$) (Table 3).

Children's Fear Scale

When evaluating fear of the blood draw, children in the control group reported being more fearful of the blood draw (3 or 4 on the fear scale) compared to children in the intervention group (38.7% vs 17.3%; $P = .007$).

Discussion

In this study, caregivers of children who received CLS interventions with blood draws reported higher satisfaction scores,

indicated their children were less fearful and spent less time in the procedure rooms than children who did not receive the interventions. These findings are important since pediatric patients have identified venipuncture as one of the most feared experiences in healthcare, and most children will experience one or more blood draws in childhood (2, 17).

Patient and Family Experience/Satisfaction

Play, preparation, and procedural support are tools utilized by CLS that increase coping strategies and improve patient and caregiver experience and satisfaction with their care (4). The present study adds to the growing body of knowledge by demonstrating CLS improve patient and caregiver experience and satisfaction. Thus, it fills an important gap related to the role of the CLS in an outpatient blood drawing lab. Observed improvements across various domains included a more positive atmosphere, increased patient comfort, and an overall more positive experience.

CLS, when located in procedural settings, can impact waiting room environments and the overall patient experience. As stated by Wilson et al, a CLS in a waiting room helps to create an atmosphere where "self-esteem is enhanced and therapeutic medical education takes place."(6) (p82). Similarly, Alcock et al demonstrated the importance of the CLS in the emergency department, showing that parents exposed to a CLS played more with their children because the CLS modeled developmentally appropriate interventions to pass the time while waiting (18). Wilson also demonstrated that CLS have a positive influence on environmental factors in an ambulatory waiting room (19).

Although no published studies have described the role of CLS related to patient and caregiver experience in an outpatient blood drawing lab in a pediatric healthcare setting, the benefits of child life presence in other settings such as inpatient medicine and radiology have been described. For example, in a programmatic review of CLS practices in a pediatric radiology department, McGee describes CLS as having a multifaceted role, including the psychological preparation of the child, parent participation, and education of healthcare providers on age-appropriate interventions. In addition, McGee describes CLS as key to increasing efficiency and fostering a positive experience by reducing the stress on children, caregivers, and the medical team (20).

In 2014, Tyson et al conducted a rigorous prospective evaluation of the impact of CLS in a pediatric imaging department. They enrolled 137 children 1 to 12 years old scheduled to undergo an imaging procedure. Intervention and control groups were randomly assigned. Using a Likert scale instrument for measurement, statistically significant differences between the intervention and control groups were found in 19 of 24 measures. Findings revealed a positive impact of a CLS on parent, staff, and child satisfaction; and parent and staff perceptions of child comfort and distress (21). Additionally, using focus groups, Drayton et al examined 18 pediatric nurses' perceptions of the CLS role in a 24-bed pediatric inpatient unit. Drayton's findings showed that involvement by the CLS led to a positive healthcare experience for the children, families, and staff and added value to the care provided on the unit as perceived by the nurses (22).

Procedure Time

The present study revealed that participants in the intervention group spent less time having their blood drawn than the control group, suggesting it is more efficient to have a CLS in the lab. Spending less time in the procedure room improves throughput, reducing wait times for patients in line. Studies show that reduced wait time for medical care can improve patient experience and satisfaction (23, 24). As patient throughput improves, more patients can be scheduled. Improved throughput, coupled with a reduction in the number of individuals to provide restraint, can increase efficiency and decrease operating costs in the outpatient blood drawing lab.

Fear

The present study revealed a statistically significant reduction in fear for children receiving the CLS intervention. This is reassuring since many studies have revealed negative implications of pediatric fear and needle pain (3, 25, 26). For example, Heden et al examined the relationship between fear and pain levels during venipuncture procedures in children. They found that according to parents, children experienced more fear than pain, even after a topical anesthetic was applied. Fearful patients tend to be less cooperative, which can impact the success of a blood draw procedure (27). The investigators suggested a focus be placed on fear-reducing interventions such as those delivered by CLS to address this issue.

Fear and pain experiences can influence individuals' medical care approaches throughout their lifetime. Pate et al linked childhood pain in the medical setting to adult fear, pain, and missed medical appointments (3). Thus, by reducing fear, CLS have the ability to improve the overall health outcomes for patients.

CLS' impact on anxiety, a term closely related to and sometimes used synonymously with fear, has also been examined. In 2006, Brewer et al implemented a double-blind intervention study of 142 children, 5 to 11 years old, undergoing otolaryngology surgery. CLS preoperatively prepared children using a validated "Child Drawing: Hospital" instrument. Children in the intervention group had a statistically significant reduction ($P = .04$) in anxiety scores (28). In another study, Piazza et al surveyed 128 phlebotomists who reported that patient and parent anxiety accounted for most of the challenges encountered during a pediatric blood draw. Approximately half of the phlebotomists had no training in child development (29). Therefore, a CLS intervention can extend beyond the child and caregiver,

affecting staff members performing the blood draw procedure. A CLS may improve the experience in a blood drawing lab for staff, caregivers, and children by decreasing fear and anxiety through developmentally appropriate support and education.

Strengths and Limitations

Strengths of this study include the prospective study design and moderate sample size. However, if repeated, there are some limitations for investigators to consider in the interpretation of this study. One explicit limitation of this study was the lack of demographic data. Modifications to the consenting process unintentionally precluded the collection of demographic data. This is important because a child's age and sex may influence their ability to cope with medical procedures. Goodenough et al found that a child's intensity and unpleasantness toward venipuncture were highly correlated with age (30). Furthermore, venipuncture unpleasantness scores of females >7 years of age were significantly higher than intensity ratings for males (30). In this study, it is not known if study group age and sex differences could have influenced this study's results.

There was also a statistically significant difference in the time of day participants had their blood drawn between the 2 study groups. It is conceivable that a child may have a mounting level of fear over the course of a day while waiting for their blood to be drawn; this is an opportunity for future research.

Another potential limitation of this study was that the RA collecting data for both study groups were not blinded to the study intervention. However, the RA was not a staff member of the blood drawing lab or CLS team and therefore did not have a vested interest in the outcome of this study.

Areas for future study include collecting demographic data and data from non-English speaking families on specific CLS interventions. Analyzing demographic data could help to determine which interventions are most effective for children of differing ages, genders, races, and ethnicities. Additionally, it would be beneficial to collect the number of venipuncture attempts and caregiver anxiety (31–34). Child life presence has the potential to impact the number of venipuncture attempts and caregiver anxiety. A recommendation to strengthen future studies on CLS in the blood drawing lab could include randomizing participants to study groups.

This study did not examine the use of topical analgesics; these products can decrease the pain significantly (35). Future studies could examine the added value of CLS when using topical analgesics. Focusing future studies on pain perception during CLS interventions will help increase our understanding of CLS' impact during painful procedures. Furthermore, this study did not examine if the interaction of a CLS has a lasting effect on future blood draws. A repeated measures design should be considered for future studies.

Conclusion

Our findings suggest that CLS implement necessary interventions to help children cope with venipuncture in the phlebotomy lab. Distraction and preparation by a CLS help to improve the overall patient experience and throughput, which have efficiency and cost-saving implications in procedural areas. As such, CLS should be considered as integral members of the medical care team wherever pediatric venipuncture occurs.

Authors' Note

This study was approved by the Boston Children's Hospital Institutional Review Board. All of the procedures in this study were conducted in accordance with the Boston Children's Hospital Institutional Board approved protocols. Verbal informed consent was obtained from a legally authorized representative(s) for anonymized patient information to be published in this article. Kate McCowan is primary coinvestigator.

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ORCID iDs

Alexandra Cole, MPH https://orcid.org/0000-0001-5587-1338
Michele DeGrazia, PhD, RN, NNP-BC, FAAN https://orcid.org/0000-0002-7362-3394

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