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Original Articles

Perceived Screen Use in Hospitalized Children: Child Life Experts' Perspectives on More Meaningful Engagement

Gitanjli Arora, MD[1a], Michael B. Pitt, MD[2], Duncan Vos, MS[3], Kelli Carroll, CCLS[4], Neelkamal Soares, MD[5]

[1] Department of Pediatrics and Division of Comfort and Palliative Medicine, Children's Hospital Los Angeles, Keck School of Medicine at University of Southern California, [2] Department of Pediatrics, Division of Pediatrics Hospital Medicine, University of Minnesota School of Medicine and Masonic Children's Hospital, [3] Department of Biomedical Sciences, Division of Epidemiology and Biostatistics, Western Michigan University Homer Stryker M.D. School of Medicine, [4] Chase Child Life Program, Mattel Children's Hospital, University of California Los Angeles, [5] Department of Pediatrics, Division of Developmental-Behavioral Pediatrics, Western Michigan University Homer Stryker M.D. School of Medicine

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Objective:
Children's environments are rich with screen media, however, very little research describing screen media use for children in the hospital setting exists. Despite innovative uses of screen media by Certified Child Life Specialists to strengthen coping and provide comfort to hospitalized children, there is little guidance for how best to use screen media in addition to the gap in research. This study surveyed child life specialists in pediatric inpatient settings to describe screen media use in hospitalized children.

Method & Results:
Using online surveys, child life specialists reported some novel uses of screen media to aid in patient care and education and identified underutilization of media to educate patients.

Conclusion:
Further studies can build off of ours to assess the potential benefits and setbacks of screen use in hospitalized children.

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From birth, it is increasingly common for children in North America to grow and develop within environments rich with both traditional and new forms of screen media. Screen time is commonly defined as any period spent viewing or using forms of screen media such as television, video games, computers, handheld video game players, videos or games on cell phones or tablets, or other devices involving engagement with a screen. Screen time may be passive, such as watching a television program, or it can be interactive, such as playing video games or through emerging technologies of virtual reality. Screen media overuse is associated with negative physical and mental health effects among youth including obesity (Institute of Medicine (US) Committee on Prevention of Obesity in Children and Youth, 2005; Zimmerman & Shimoga, 2014), disordered sleep (Dwork M, et al., 2007; Hysing et al., 2015; Zimmerman, 2008), aggressive behaviors (Wilson et al., 2002), attention-deficit/hyperactivity disorder (Acevedo-Polakovich et al., 2006), impaired cognitive development (Zimmerman & Christakis, 2005), mood disorders (Erdogan et al., 2006), and psychological distress (Erdogan et al., 2006; Hamer et al., 2009; Primack et al., 2009). There is also emerging research of possible benefits for the use of interactive media for children in certain settings (Christakis et al., 2013; Kirkorian et al., 2016). Some television programming has been associated with vocabulary knowledge and expressive language skills (Linebarger & Walker, 2005), and interactive applications (apps) may facilitate retention of taught material comparable to real-life encounters (Radesky et al., 2015).

The American Academy of Pediatrics (AAP) encourages pediatric practitioners to offer specific guidance to help patients and families manage media use (American Academy of Pediatrics & Council on Communications and Media,

a garora@chla.usc.edu

2016a, 2016b). As media use evolves, our understanding of the impact of screen time on typically developing children continues to grow. It has been suggested that maximizing the positive impact and minimizing the negative effects of screen media use requires an accurate understanding of the role media plays in children's lives: which platforms they are using, the activities and content they are engaging with on those platforms, and how media use patterns vary based on circumstance (Rideout, 2013). An understanding of screen media use is likely also important for children with unique medical situations, including frequent and/or prolonged hospitalizations.

Screen media is a common diversion activity for hospitalized children with a recent study finding that hospitalized children were engaged in screen media in 80% of daytime observations (Arora et al., 2015). The reasons for this are likely multifactorial but may include feeling too ill to engage in other activities, an effort to escape boredom, or to distract from emotional distress and physical discomfort. However, in creating a therapeutic environment for optimal recovery, children need high-quality sleep and close monitoring of activities that could contribute to distress, depression, or aggression. High screen media use in hospitalized children could interfere with sleep, mood, and eating in ways that may negatively affect health and healing (Irwin et al., 1994; Mostaghimi et al., 2005). In contrast to screen media used as an entertainment source, novel and interactive uses of screen media have been shown to aid in coping and comfort for hospitalized children (Guttentag et al., 1981; McQueen et al., 2012). Innovative uses of screen media enable children to connect to school, other hospitalized children, and their family and friends (Hamlet & Herrick, 2011; Hopkins et al., 2014; Yang et al., 2014).

For hospitalized children undergoing procedures and interventions that can be painful and anxiety provoking, screen media offers a non-pharmacologic distraction technique helpful in decreasing the need for restraint and sedation (McQueen et al., 2012). Immersive media, such as virtual reality, builds upon children's skills of imagination and magical thinking to decrease pain and anxiety during procedures (Won et al., 2017). Screen media can also be a useful tool for preparation. Through virtual reality technologies, children can "walk" through the hospital or operating room in advance of their procedure (Eijlers et al., 2019), allowing them the opportunity for questions and concerns to be addressed by parents and hospital staff. Interactive screen media can facilitate training on diabetes management, medication administration, equipment care for children who are technology-dependent and provide anticipatory guidance or simulate the experience of transition home for patients in hospice at end-of-life.

Certified Child Life Specialists (CCLSs) are uniquely positioned to have an informative perspective on the ways in which screen media is used among hospitalized patients. In focusing on the optimal development and well-being of children, CCLSs promote coping skills and work towards minimizing the adverse effects of hospitalization and stressful health care experiences (Committee on Hospital Care and Child Life Council, 2014). In pediatric hospital-based care, CCLSs use therapeutic play and developmentally appropriate communication to promote optimal development; educate children and families about health conditions; prepare children and their families for medical events and procedures; and develop, plan, and rehearse useful coping strategies with patients and their families (Romito et al., 2021).

Given this background, the investigators sought the insights of CCLSs on perceptions of media use in inpatient pediatric settings to evaluate the perceived frequency and types of screen media use CCLSs encounter with their patients. The study also sought to gather their expert opinions on the acceptability of perceived quantity of screen usage. In addition to quantifying media use, the investigators sought to identify novel uses of screen media in supporting the work of CCLSs in distraction for procedures, school education participation, education about a disease and treatment plan, procedural preparation, or for other instructive or assistive purposes. This national survey of CCLSs is a first step in understanding the use of screen media at inpatient pediatric centers across the country. By combining an understanding of the impact of screen media on physiologic and psychologic health with descriptions of the current perceived quantity and modalities of screen media use among hospitalized children, the investigators hope this study can serve to inform hospitals and pediatric practitioners, including CCLSs, to guide and advocate for responsible screen use for hospitalized children at their own programs, institutions, and nationally.

Method

The investigative team developed the Media Use in Inpatient Pediatrics Survey, a 21-question mixed-methods survey to collect data on the hospital setting, types of screen media used by hospitalized children, and perceptions of CCLSs on screen media utilization. The instrument was refined with feedback from three CCLSs in separate institutions that were not part of the final study sample.

The survey consisted of demographic items relating to the institution(s) and inquired about perceived frequency of various types of media use including live television channels, streaming services, on-demand patient education programming on topics relevant to medical care, prescriptive patient education, videoconferencing, traditional and virtual screen media as a distraction for pain and procedures, and overall screen media use. Participants were asked to identify if inpatient pediatric patients have access to media types and rate their perceived frequency of each type of media use on a five-point Likert-type scale; 5=Far too much, 4=Too much, 3=About right, 2= Too little, and 1= Far too little.

In March 2018, the survey was circulated by one of the authors to the Association of Child Life Professionals Program Leaders listserv, a self-reported list of leaders of child life programs from across the country. This listserv posts a daily digest addressing evidence-based practice updates, specific clinical and management concerns, and resources. At the time of distribution, the daily digest was distributed to 349 email addresses. The description of the study asked

Table 1. Demographics as reported by survey respondents with items reported as n frequency (percent).

Practitioner Type	Child life director	20	(50%)
	Child life specialist	17	(42.5%)
	Child life other (reported as educator, lead, and supervisor)	3	(7.5%)
Location of Program	Urban	27	(67.5%)
	Suburban	11	(27.5%)
	Rural	2	(5%)
Type of Hospital	Academic teaching hospital	27	(69.2%)
	Community hospital	12	(30.8%)
Type of Pediatrics Unit	Freestanding children's hospital	9	(23.1%)
	Children's hospital within a larger medical center	18	(46.2%)
	Pediatric ward within a larger medical center	12	(30.8%)
Number of Inpatient Pediatric Beds*	Less than 20	1	(2.5%)
	21 to 49	3	(7.5%)
	50 to 99	11	(27.5%)
	100 to 199	15	(37.5%)
	200 to 299	4	(10%)
	300 to 399	2	(5%)
	400 to 499	1	(2.5%)
	More than 500	1	(2.5%)
	Don't know/decline to answer	2	(5%)

* Number of pediatric beds including NICU, PICU, pediatric wards, and pediatric surgery

for responses from CCLSs of programs that serve hospitalized children. Over two months, three reminders were sent to encourage survey completion through the digest. REDCap (Harris et al., 2009) electronic data tools were used to collect and manage the survey data.

The investigators used descriptive analysis to assess the distribution of each survey item. Qualitative items were reported as frequency (percent) and quantitative items were reported as mean (standard deviation). All analyses were conducted using SAS v9.4. The primary author's Institutional Review Board (IRB) approval was obtained as an exempt study, meaning no risk was being posed to patients for participation in this survey.

Results

Forty respondents representing a diverse sampling of pediatric inpatient facilities completed the Media Use in Inpatient Pediatrics Survey (see Table 1). All respondents reported their affiliated programs as being based within the United States with each of the 10 AAP districts (American Academy of Pediatrics, 2018) represented by at least one respondent in the sample.

All respondents (N =40) reported having a child life program that provides services to inpatient pediatric patients. Of the 40 respondents, 36 completed the descriptive data as related to number of child life specialists with a median number of 3.5 specialists employed to serve the inpatient pediatric population.

Thirty-six respondents completed the survey questions related to perceived screen media use in inpatient pediatrics settings. All 36 respondents indicated that 100% of patients have access to televisions in their hospital rooms, and most indicated that patients have access to video games (88.9%) and tablets (86.1%) in their rooms as well. Table 2 describes access to screen media devices for hospitalized pediatric patients within their rooms either as permanent fixture or on loan and in common areas (e.g., child life playrooms).

To determine the relative perceived frequency of use of each media type by inpatient pediatric patients, respondents' Likert-type ratings of each media type were reported as frequency (percent). Table 3 shows the frequency (%) Likert-type rating of the respondents' perception of overall screen media use and use of each of the screen media types. The majority of CCLSs *(n=22; 61.12%)* indicated overall screen media use was either 'Too much' or 'Far too much'. Similarly, the majority of CCLSs (*n=20; 47.14%)* indicated use of live television channels (e.g., network or cable TV) was 'too much' or 'far too much'.

A subgroup analysis was performed to evaluate the perceived patient screen time frequency by CCLS role (self-identified as director/other versus specialist). Most child life directors (*n=14; 73.68%)* rated overall perceived screen media usage as 'Too Much,' whereas, the majority of those identifying themselves as child life specialists (*n=10; 58.82%)* rated screen media usage as 'About Right.' Similarly, with regard to live television channels the majority (*n=11*; *61.11%)* of child life directors reporting perceived usage as 'Too Much,' and majority of child life specialists (*n=9; 52.94%)* reporting perceived usage as 'About Right.' Regarding each of the other forms of media, no noteworthy

Table 2. Description of perceived screen media devices and access (with respondents able to select all descriptions of screen media access that applies to their institution).

Screen Media Device	Patient Rooms		Common Areas	
	n	%	*n*	%
TV	36	100	33	91.7
Video game console	32	88.9	24	66.7
Handheld video games	17	47.2	7	19.4
Desktop or laptop computer	15	41.7	19	52.8
Tablet	31	86.1	6	16.7
Smart-phone	0	0	0	0
Virtual reality headset	9	25	3	8.3
Other media equipment (Starlight carts, Stereo, Beats Pill)	1	2.8	1	2.5
Network TV	25	69.4	21	58.3
Cable TV	31	86.1	24	66.7
On-demand non Interactive entertainment (eg. Apple TV, Netflix)	9	25	5	13.9
DVD or Blu-Ray movies or shows	32	88.9	16	44.4
Video games	31	86.1	22	61.1
Other	3	8.3	1	2.8

* Get Well Network™, movies on gaming systems, and closed-circuit live broadcast and hospital education channel that runs pre-programmed videos
** Closed circuit live broadcast channel and education channel that runs pre-programmed videos

Table 3. Respondent perception of various screen media use by inpatient pediatric patients, reported as perceived frequency (%) as Likert-type rating of media type usage.

	Far too little	Too little	About right	Too much	Far too much
Media Overall	0	0	14 (38.89%)	20 (55.56%)	2 (5.56%)
Live television channels	0	0	15 (42.86%)	17 (48.57%)	3 (8.57%)
Streaming On-Demand Movies and TV Programming Services	3 (23.08%)	1 (7.69%)	8 (61.54%)	1 (7.69%)	0
On-Demand patient education programming	7 (36.84%)	9 (47.37%)	3 (15.79%)	0	0
Prescribable patient education programming	7 (36.84%)	10 (52.63%)	2 (10.53%)	0	0
Videoconferencing	5 (29.41%)	5 (29.41%)	7 (41.18%)	0	0
2D screen medias as a distraction for pain	3 (12.50%)	5 (20.83%)	14 (58.33%)	2 (8.33%)	0
Virtual reality as a distraction for pain	5 (38.46%)	3 (23.08%)	5 (38.46%)	0	0

differences in proportions were observed and low cell counts diminished generalizability.

Respondents reported that some types of screen media were underutilized, including on-demand patient education programming on topics relevant to medical care and prescriptive patient education programming as identified by the healthcare practitioner to be relevant to the patient's medical care. The survey did not ask respondents to differentiate if patient health related programing was utilized "too little" because it is unavailable, not prescribed, or was not used by patients.

Respondents were provided the opportunity to share additional thoughts about screen media use among hospitalized children with one respondent noting:

> *As nice as it can be to have TVs in every patient room, it can also be challenging for development and [for] encouraging children who [do] feel well to leave their rooms.*

Two comments related to the age of patients:

> *Often families are watching the screen more than the children, and the patient cannot escape it. [Patients] need time for healing and quiet and low stimulation. It worries me, the exposure that our under 3-year-old [patients] get to the screen [because of] caregiver use.*
> *We have had many discussions about screen time, specifically for our [under] 2-year-old population. Often the televisions are left on, etc. As a facility we are working to enhance educational knowledge to both staff and families on the importance of screen time limitations.*

One respondent reflected on the perceived amount of hospital screen time a patient might receive:

> *I don't have much concern for the level of screen time in the majority of our acute care kiddos. The group I worry about are those long-term, chronic patients who sit in a room alone. Medical staff turn on the TV for them and leave, as opposed to staying to build rapport and teach caring interaction.*

Respondents also noted the importance of balancing media use with other interactive interventions and individualizing (object needed here- methods? Play techniques?) to meet the needs of each patient:

> *Our Child Life staff strives to balance media use with interactive and engaging non-directed play outlets. We have access to an abundance of play and craft materials for all ages. We do have the option to check out iPads, video game consoles, or DVDs, but that is balanced with a check out system for toys and other play materials, as well. We also have a very large play atrium with pool, air hockey, free play materials, crafts and special events.*
> *We do utilize technology, but our goal is to always engage with other mediums whenever possible. We have suitable activities for tween/teenaged patients as well as younger patients besides solely focusing on technology.*
> *Media does offer ways for patients to refocus and aid in support during procedures as well as normalize environment. However, media is not used as a means to offer therapeutic play because this is not what therapeutic play is. You really can't categorize therapeutic play and media in the same category.*
> *We believe preparation should be in person and individualized. We also adhere to a strong play philosophy that engages children of all ages with materials, toys and activities. We do not classify screen use as therapeutic play.*

When asked about hospital policies on restricting media use, approximately half of the respondents reported their institutions as having parental controls on internet use (n=15, 41.7%) and on institution-owned screen media devices (n=21, 58.3%). Eleven (30.6%) reported having restrictions on television channels. One respondent reported that their institution has a screen media curfew to turn off all screen media devices, including personal devices, at a specified time. About 20% of respondents were unsure of hospitals' media restriction policies.

When asked about the use of media in novel ways, such as to aid in therapeutic play, procedure preparation, education, or other innovative and interactive uses of media, 38.9% (n=14) of respondents identified their institution as using media in novel ways. Tablets, specifically iPads, were identified as a common tool for distraction; with one participant noting "*We balance the use of technology for preparation purposes, normalizing the environment and procedural support. There are times that we find it very helpful to assist with procedures, but also try to balance this with engaging child-directed play opportunities*." One institution reported video diversion experiences, describing the "*TV screens located above the bed, on the ceiling, meant to be viewed with the patient laying down in radiology, pediatric day unit, and [surgical unit]. In the diversion experience, patients can experience 'launching' into outer space, [being in] ocean scenes, among many more.*"

Discussion

This study found that among a sample size of 40 CCLSs in North America, CCLSs report hospitalized children have ubiquitous access to screen media with a perceived high frequency of use, all respondents reported that 100% of the children at their institution had televisions in their hospital rooms, and only one respondent reported their institution as having a screen media curfew to discourage night-time screen use. The AAP recommends that non-educational screen use be limited to no more than two hours per day, that television sets and internet connections should be avoided in a child's room, and that nighttime screen use should be limited (American Academy of Pediatrics & Council on Communications and Media, 2013, 2016a, 2016b). Yet previous research has shown that watching television is a common, and often the predominant, diversionary activity for hospitalized children during sleeping and waking hours, being used at rates far higher than recommended by the AAP (Arora et al., 2015; Bordeaux, 1986; Guttentag et al., 1981; Simon et al., 2010). Given that there are known negative health effects of screen media use and that CCLSs in our study rated overall perceived screen media use as between "about right" and "too much," hospitals should partner with CCLSs and other pediatric practitioners to offer guidance on screen media utilization for pediatric patients and encourage activities that promote health and wellbeing. In this survey, the quantity of time of screen media engagement was not defined by hours, but rather left to the CCLSs perspective of what constitutes the scale of far too much to far too little screen engagement. In future studies, it would be helpful to understand how these descriptions of screen media engagement correlate to the AAP guidance on the quantity and quality of screen media use."

While several CCLSs commented on the importance of separating screen use from therapeutic play, the pervasive use of screen media, however, may lead to the incorporation of screen use into more interactive play or even into therapeutic play. The potential for beneficial and novel use of screen media to support patients with distraction, procedural preparation, and facilitation of coping and normal-

ization should lead hospitals to offer greater guidance on screen media utilization for pediatric inpatients. Further studies are needed to inform the impact and role of novel screen media use in hospitalized pediatric patients.

CCLSs in our study most often reported that patient education screen media was underutilized in their institution. Both on-demand and prescriptive screen media were identified by CCLSs to be relevant to medical care were identified as being used "too little" or "far too little." Due to the limitations of our survey, it is unclear if prescriptive patient education programing is being used too little because it is not available within the hospital, it is not being prescribed, or if it is being prescribed and not being used by the patient. Given the high access to screen media by hospitalized children and the importance of transmitting health information to facilitate patient and family-centered care and adherence to prescribed medical regimens, prescriptive patient education programing through screen media may offer an important opportunity to improve patient care and communication.

Limitations

There are limitations to this study. The survey instrument was developed for the purpose of this novel study population and has not been independently validated. Future studies would need to validate on larger sample groups. In distributing the survey through the Association of Child Life Professionals Program Leaders listserv, we captured the perspectives of child life specialists at the bedside, as well as ones director and other leadership roles. These results may be less generalizable as these CCLSs may have less time at the bedside with patients. Future studies which involve a more representative sample of CCLSs would be helpful. Additionally, respondents rated their perceived frequency of screen media use by hospitalized children and did not actually quantify the use through direct observations as done in a previous study (Arora et al., 2015). The survey did not ask CCLSs to describe optimal screen media utilization for hospitalized children. This information may have been helpful to better understand why respondents did not indicate screen media use as "far too much" even though time use may have exceeded AAP recommendations. There may also be a response bias where CCLSs who work at institutions with newer technology chose to respond to the survey. Further, by not collecting demographic data about the CCLS or the patient makeup, we are not able to comment on perception variance or disparities in access. The use of CCLSs' personal screens was not accounted for, either. There may also be an influence of generational or training differences between CLP directors and specialists which may impact perception of screen media use (Deloitte, 2018). Additional qualitative data collection from CCLSs via guided questions could be helpful to better understand screen media usefulness in the care of hospitalized children and the factors influencing CCLSs' perceptions of screen use. While the low response rate to the survey limits generalizability of frequencies of inpatient screen use, the gathered perspectives of CCLSs remains valuable, as their unique perspective on the roles of screen media in children, particularly screen overuse, has not previously been reported according to our knowledge. Importantly, while not a limitation per se, it is worth noting this study took place before the COVID-19 pandemic changed the ways all of us interact with screens – both in the hospital and at home – and future studies may yield new results.

While this study allowed us to assess the perspectives of CCLSs in regards to screen use, we did not directly observe the amount of time individual patients engaged in screen use or assess patient or caregiver perceptions of screen use while hospitalized. Given this study found that hospitalized children have ubiquitous access to screen media and identified opportunities to use screen media for therapeutic play, procedure preparation, and patient education, a larger multi-institutional study to directly observe patients engaging with screen media and obtain qualitative data from CCLSs, patients, and caregivers would be an important contribution to understanding and guiding screen media use in hospitalized children.

Conclusion

Hospitals that care for the medical needs of children have a responsibility to create therapeutic environments for optimal health and recovery. Pediatric practitioners, particularly in the inpatient setting, have an opportunity to share important information about screen use and model behaviors that promote optimal child development, to enhance coping skills, and to utilize novel technology to enhance medical understanding of procedures, disease conditions, and management and treatment. Given the recognized role of CCLSs in focusing on optimal development, promoting coping skills, and minimizing adverse psychological effects associated with hospitalization (Romito et al., 2021), CCLSs are important advocates for child-centric healing environments that promote physiologic and psychologic functioning. While it is likely that screen media is being used for distraction, we would assert that there are other more developmentally appropriate and engaging techniques for distraction that should be more readily available in places of pediatric expertise. The knowledge of CCLSs, acquired through training and clinical experience, should be harnessed to consider what optimal healing environments might look like. Hospitals can partner with CCLSs to better understand current screen media use within their hospital, describing the quantity of use and types of screen media in use. CCLSs can also consider what potential screen media uses as tools for distraction, preparation, coping, and education would be helpful to their patient populations. Instead of a child recovering, or for those with chronic medical conditions and frequent hospitalizations, spending an extended period of time in environments with many screens, CCLSs could help to reimagine a healing environment with more frequent therapeutic play, virtual learning, one-on-one educational instruction tailored to the needs of the child, and medical teaching. Pediatric practitioners in the outpatient setting discuss the importance of playtime, reading, and limiting screen use and yet in the hospital setting we do not model this healthy environment.

Conclusion

As CCLSs have knowledge of stressors occurring in hospitalized children and expertise in strengthening coping skills, CCLSs provide an important perspective on the screen methodologies children are using for distraction and comfort when hospitalized. CCLSs in this study report that hospitalized children have ubiquitous access to screen media with a perceived high frequency of use and that screen media for patient health education is underutilized. As such, CCLSs have an essential role in guiding how hospitals incorporate screen media use as a distraction, educational, interactive, and therapeutic intervention for pediatric patients. The expertise of CCLSs, whose primary role is to focus on the well-being of children while promoting optimal development and minimizing the adverse effects of children's experiences in hospital setting, is crucial to identifying activities and strategies to positively incorporate evolving screen media technology.

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Address correspondence to:

Gitanjli Arora, Children's Hospital Los Angeles, 4650 Sunset Blvd, Los Angeles, CA 90027, [garora@chla.usc.edu], 323-660-2450

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