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Amanda Manderfeld

Jennifer A. Marshall

Elizabeth J. Willen

Jami Gross-Toalson

Amy Ricketts

See next page for additional authors

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Authors

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Pilot Study of mHealth Adherence by Parents to a Pediatric Developmental Application for Infants after Neonatal Cardiac Surgery

Amanda Manderfeld¹, MSN, RN, CPN; Jennifer Marshall¹, MPH, RN, RRT, CCRC; Elizabeth Willen, PhD^{1,2}, Jami Gross-Toalson, PhD^{1,2}; Amy Ricketts¹, MSN, RN, CPN; Melissa Elliott¹, PhD(c), MSN, FNP-BC; Nickey Crail¹, BSN, RN, CPN; Lori Erickson, PhD^{1,3}, MSN, CPNP-PC

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Introduction

- The use of mobile health (mHealth) applications is widespread in adult care but has been used less in pediatric care due to the unique challenges of pediatric interventions, especially for children with congenital heart disease (CHD)¹.
- High incidence of mobile phone ownership provides a low-cost, broad reach intervention for developmental support for pediatric populations²⁻³.
- Infants with complex CHD are at high risk for experiencing multiple developmental delays, including impairments in cognition, social interaction, language development, attention, executive functioning and fine/gross motor skills⁴.

Purpose: to evaluate mHealth adherence and acceptance of a developmental application, Babysparks®, by parents of infants with CHD.

Methods

A single site, cross sectional, pilot study, with a pre/post-test design was used to evaluate the mHealth adherence at a parental self-imposed rate over 6 months after pediatric CHD surgery for children < 18 months of age.

References

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Affiliations: 1-Children's Mercy Hospital; 2-UMKC School of Medicine; 3-UMKC School of Nursing

Results

- Of 101 potentials, 66 parents enrolled with 83.1% (n=54) successfully initiating the app link.
- Utilization of the developmental videos was found in 29 parents (43.9%).
- No differences in Demographics were noted, but a higher rate of adherence for parents of children with feeding tubes versus solely oral (PO) feeds was noted, with only 37.9% adherence of PO feed solely patients (p=.021, n=25/66).
- 87.3% (n=48) of parents reported daily mobile use, while a low rate of utilization of therapies outside the hospital was noted at 44.6%.
- Table 1** presents adherence rates across developmental domains. Implementation was highest for gross motor (89.6%, n=26/29) and speech (75.9%, n=22/29).
- At study exit, 87.2% (n=34/39) of parents reported the app was easy to use, and 100% (n=39/39) agreed that regular use of this app would help other children with CHD.

Table 1: Adherence	Total Cohort n=66	Utilized Videos n=29	Not utilized videos n=33	P value
Initiation of accepting app invite (days)	4.18 ±10.2	5.82 ±12.16	2.79 ±8.01	.248
Implementation- Gross motor (activities)	5.92 ±18.93	12.48 ±26.39	.15 ±.87	.009
Implementation- Fine motor (activities)	.84 ±2.8	1.79 ±3.93	.00 ±.00	.011
Implementation- Cognitive (activities)	1.73 ±4.1	3.48 ±5.42	.18 ±1.04	.001
Implementation- Speech (activities)	1.89 ±5.3	3.97 ±7.20	.06 ±.348	.003
Implementation-Sensory (activities)	3.74 ±11.33	7.72 ±15.59	.13 ±.707	.008
Implementation- Self Care (activities)	.21 ±.71	.45 ±.99	.00 ±.00	.011
Implementation- Social Emotional (activities)	1.32 ±5.0	2.83 ±7.14	.00 ±.00	.026
Utilization of Total Number of videos	15.45 ±46.9	33.03 ±64.67	.00 ±.00	.005
Milestones Reached Parent reported	18.68 ±41.82	37.8 ±55.47	1.91 ±4.65	<.001
Persistence with app (days)	48.1 ±60.36	79.76 ±60.17	20.3 ±45.5	<.001

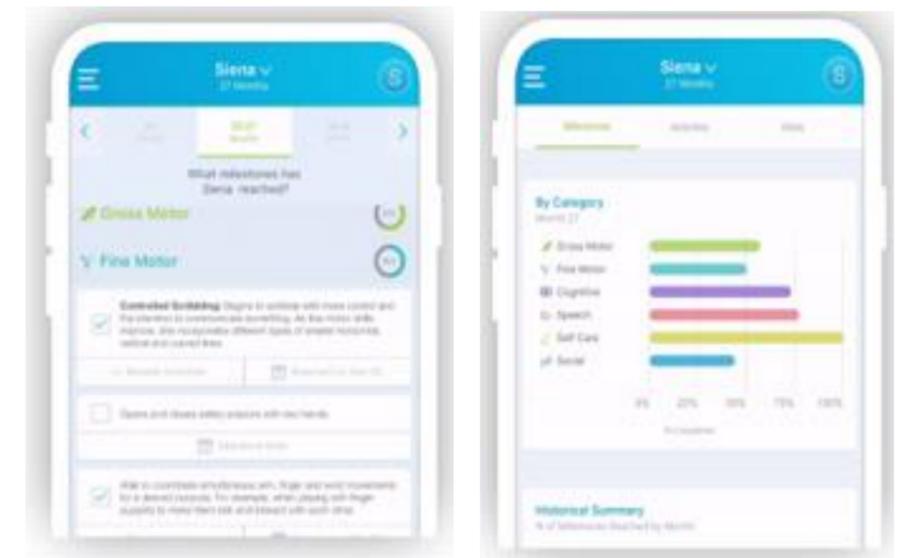
Mean ± Standard Deviation compared with independent samples t-test with 2-tailed significance with equal variances assumed

Contact: anmanderfeld@cmh.edu

Discussion

- Adherence and acceptance of the mHealth app was high but implementation of the videos was low at 43.9%, likely due to self-management factors with additional stress of complex care regimens including pediatric feeding tubes.
- Developmental milestones were more frequently reached when the videos were accessed.
- A key area of future research is two-way communication with the CHD developmental team utilizing the mHealth dashboard and implementation rates of use with parents.

BabySparks Application



<https://babysparks.com/app-overview/>

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