Role of Apps for Tracking Child Health and Development in the Clinic and at Home

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Abstract

The increasing availability of mHealth apps has not yet been followed by much research regarding provider and parent utilization and perceived acceptability. The present study examined the pre-implementation phase of pilot trial of BabyNoggin™, a developmental screening app, in two pediatric clinics. Surveys (n=199) were used to examine parental attitudes towards child health and development tracking apps. 5 providers were interviewed for perspectives on implementation. Potential barriers and facilitators to implementation were identified and post-implementation workflow proposed based on clinic observations. Parents indicated interest towards child development tracking apps if recommended by a doctor. Working with teams prior to implementation may improve app use. Future research will examine the effects of BabyNoggin™ implementation on workflow, as well as provider attitudes towards child development tracking.

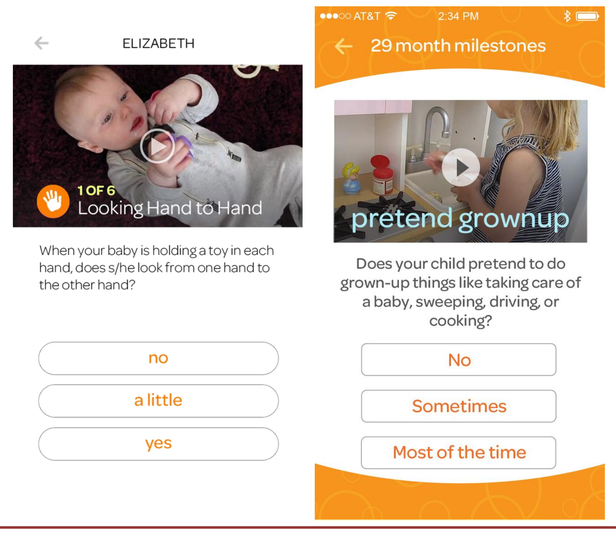
Introduction

- Health apps are common; little research done on feasibility, efficacy, and provider acceptability[1]
- Healthcare provider recommendations may encourage patients to download apps[2]
- Ages and Stages Questionnaire (ASQ) and Modified Checklist for Autism in Toddlers (M-CHAT) commonly used in pediatric clinics to screen for developmental delays & Autism Spectrum Disorder
- BabyNoggin™ can be used to administer ASQ and M-CHAT

Material and Methods

- 10 observations were made in Infant Growth and Development clinic, 11 in Diagnostic clinic
- 26 item parent survey administered in paper form in clinic and and online to 199 parents with children ages 0-5 recruited through social media
- 15 item provider survey based on Consolidated Framework for Implementation Research (CFIR) administered through semi-structured interviews with 5 providers across the clinics

Figure 1. Screenshots of BabyNoggin™ app displaying ASQ questionnaire with demonstrative videos



Results

Table 1. Potential facilitators and barriers of BabyNoggin™ implementation for patients and providers

	Potential Facilitators	Potential Barriers
Providers	• Automatic scoring-reduces mistakes and time spent scoring • No risk of family forgetting paper forms • More accurate responses due to video demonstrations • Less time for clarifying questions for families • Can print results directly from app • Parents potentially more likely to answer all questions on tablet than in paper form	• Technical difficulties • Not having questionnaires completed before patient-physician encounter • ASQ will take longer due to videos • Will have to manually input results into charts • Logistical issues with follow-up responses after discharge from clinic • Having to wait for available tablet • Financial support to pay for ongoing use
Parents	• Helpful 10-second videos built into ASQ • Multiple languages available • Questions read aloud-helps those with literacy difficulties • Not having to fill out ASQs before visit • May have preference for electronic rather than paper forms (i.e. bigger font) • Children may be entertained by videos • More convenient to fill out (tap instead of using paper, pen, and hard surface)	• Technical difficulties • ASQ will take longer due to videos • Having to fill out questionnaires on both app and paper intake forms • Unfamiliarity using technology • Child being distracted by tablet and interfering with questionnaire completion

Figure 2. Pre-implementation and proposed post-implementation clinic workflow of Infant Growth and Development clinic

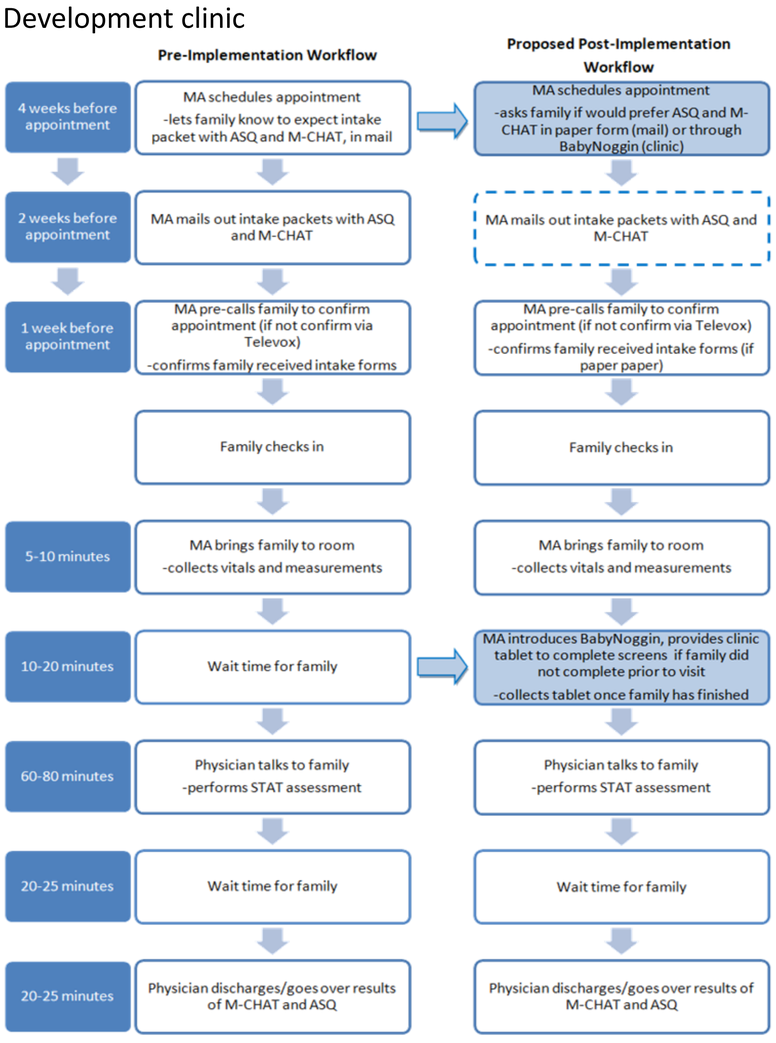
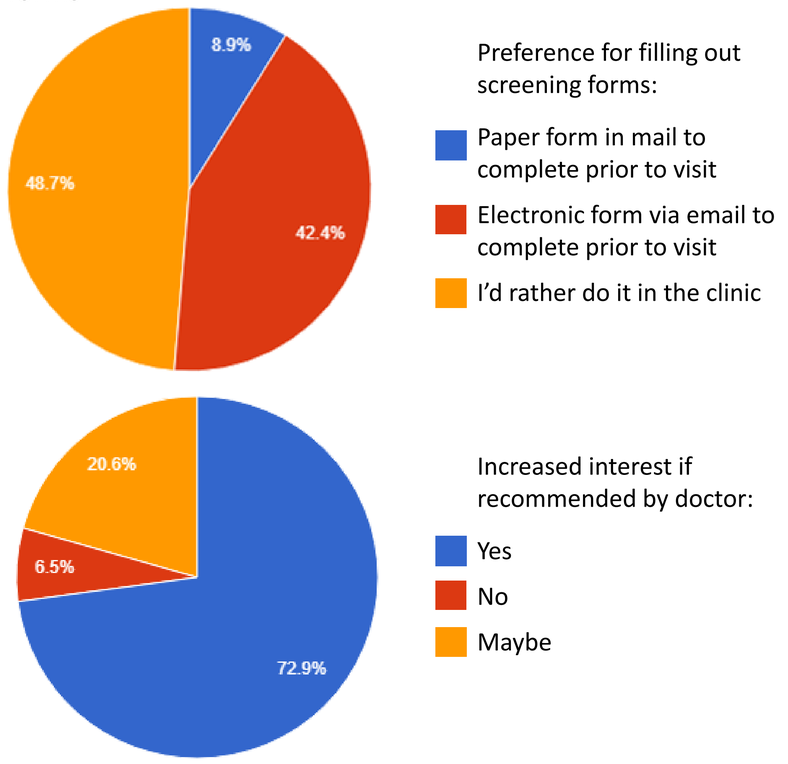


Table 2. Demographics of parent responders (n=199)

	n (%)		n (%)
Gender		Highest level of school	
Female	192 (97.5%)	Did not complete high school	2 (1.0%)
Age		High school	21 (10.6%)
18-21	12 (6.1%)	GED	6 (3.0%
22-29	73 (36.9%)	Some college	42 (21.2%)
30-39	97 (49.0%)	2-year college	22 (11.1%)
40-49	14 (7.1%)	4-year college	50 (25.3%)
Race		Trade school	4 (2.0%)
White	177 (89.4%)	Graduate school	51 (25.8%)
Black or African-American	10 (5.1%)	Marital Status	
Native American	5 (2.5%)	Married	157 (79.3%)
Asian	7 (3.5%)	Divorced	2 (1.0%)
Ethnicity		Separated	1 (0.5%)
Hispanic or Latino	21 (10.6%)	Never been married	38 (19.2%)

Figure 3. Parent opinions on clinical use of apps and screening forms



- 67.8% parents indicated having at least one app related to child health and development tracking
- Parents (64.0%) most often cited wanting convenient way to track development as reason for downloading child health tracking apps
- Parents most often cited uncertainty over which app to download (31.6%), not thinking about apps for this purpose (25.6%), and unwillingness to pay for apps (24.8%) as barriers to downloading the apps

Discussion

- Implementation of new strategies in clinics tends to be time-intensive and encounter many unexpected obstacles and delays
- Potential barriers (e.g. no integration into HER, technology problems) and facilitators (e.g. functionality and efficiency) should be considered throughout implementation process
- Parents showed interest in child development tracking apps, indicating expansion of mobile health may improve low screening rates[3]; continuing evaluation needed to examine app efficiency and usage in clinic and at home

Future Directions

- Examining effects of BabyNoggin™ implementation on workflow through clinic observations and CFIR interviews with provider teams
- Examining parent attitudes towards such apps in a larger population
- Investigating provider attitudes towards child development tracking

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Acknowledgements

This project was made possible by the Infant Growth and Development clinical team, the STAT diagnostic clinical team led by Dr. Swec, and the STAT diagnostic clinical team led by Dr. Huskins at Riley Children's Hospital.