

Comic Book Education and Functional Oral Health Literacy in Children

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Background

- Significant gaps exist in oral health knowledge and behaviors among children leading to health disparities.
- Children and caregivers from lower socioeconomic backgrounds may have lower oral health literacy.
- Approaches beyond verbal instruction have not been investigated for evaluating and improving oral health literacy in children.

Hypothesis and Objectives

The **objectives** of this two-arm randomized controlled study are to:

- Determine if comic book instruction can help improve oral health literacy for children and caregivers.
- Determine if improved oral health literacy is matched by a sustained improvement in clinical outcomes long term.

H₀ : There is no difference in oral health knowledge for subjects given verbal oral health education compared to subjects given comic book instruction.

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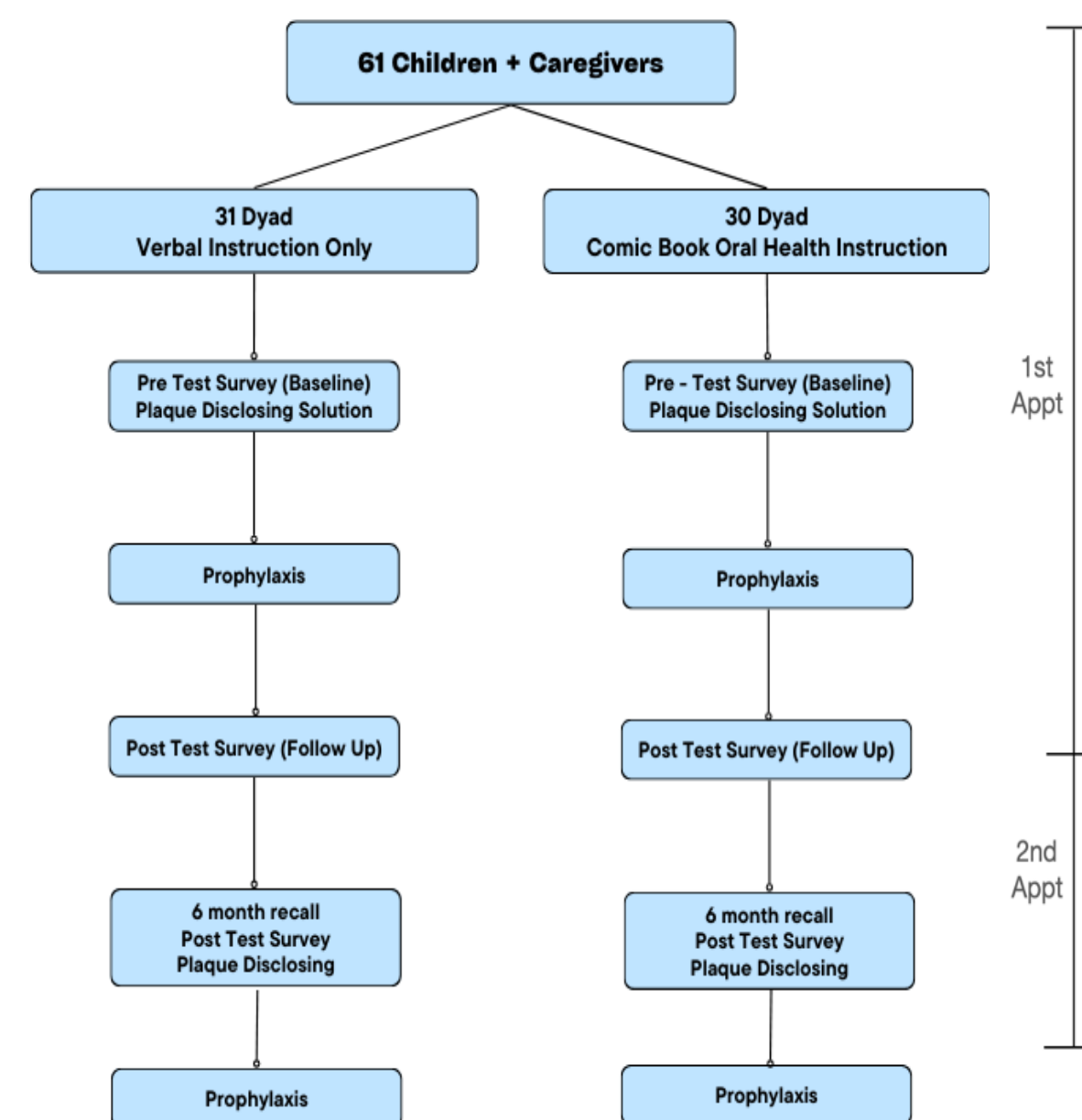
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IRB Protocol #2022-1324

Methods

- Children (7 – 12 years old) due for recall were recruited from UIC College of Dentistry postgraduate and undergraduate pediatric dental clinics. Children and caregiver were randomly assigned to the control group (verbal instruction only) or intervention (use of comic book) group.
- Statistical analysis included Wilcoxon rank sum test, Chi– squared tests or Fischer’s exact test and linear mixed effects model. A p-value of < 0.5 was used to determine statistical significance.

Fig. 1 Study Design and Methodology Flowchart



Inclusion Criteria

- Medically healthy
- English – speaking
- Caregiver is legal guardian



Recruitment

- May 2023 – November 2023



Intervention

- Novel dental comic embedded with selected augmented reality features with oral hygiene instruction (developed in collaboration with Markus Santoso, PhD)

Results

- There was no baseline difference in oral health beliefs for children. In caregivers, there was a significant statistical difference in oral health knowledge following use of comic book instruction at the baseline visit regarding the importance of drinking fluoridated water (p = 0.003).



Fig. 2 & 3 – Comic Book Content

Table 1 – Sample Demographics of Child Participants

Characteristics	Control N = 31	Intervention N = 30	p - value*
Age (median, interquartile range)	9 (8, 11)	10 (8.5, 11)	0.13
Gender			0.5
Female	11 (37%)	14 (45%)	
Male	20 (63%)	16 (55%)	
Race			> 0.9
Hispanic	16 (53%)	17 (55%)	
Non-Hispanic	15 (47%)	13 (45%)	
Ethnicity			0.8
African American	7 (23%)	6 (19%)	
Arabic	0 (0%)	2 (6.5%)	
Asian	3 (10%)	2 (6.5%)	
Hispanic	16 (53%)	17 (55%)	
White	5 (13%)	3 (13%)	

* Median (IQR); n (%)

* Wilcoxon rank sum test; Pearson's Chi-squared test; Fisher's exact test

Table 2 – Child Responses for Oral Health Beliefs

	Child Baseline Oral Health Beliefs			Child Follow Up Oral Health Beliefs		
	Control, N = 31	Intervention, N = 30	p - value	Control, N = 31	Intervention, N = 30	p - value
I don't need to brush my teeth everyday			0.7			> 0.9
Correct	26 (84%)	27 (90%)		29 (97%)	27 (96%)	
I have to brush my teeth to keep my teeth and gums very clean			> 0.9			> 0.9
Correct	28 (90%)	28 (93%)		30 (97%)	28 (100%)	
I don't need to use fluoride toothpaste when I brush my teeth			0.2			0.15
Correct	18 (58%)	22 (73%)		26 (84%)	19 (68%)	
I only need to brush my front teeth			0.7			0.6
Correct	25 (81%)	26 (87%)		30 (97%)	26 (93%)	
I have to see a dentist regularly			> 0.9			0.2
Correct	25 (81%)	24 (80%)		24 (77%)	26 (93%)	
I need to use dental floss to remove food between my teeth			0.4			0.5
Correct	30 (97%)	27 (90%)		29 (94%)	28 (100%)	
When should you brush your teeth?			> 0.9			0.5
In the morning when you wake up and at night when you go to sleep	29 (94%)	28 (93%)		31 (100%)	27 (96%)	
What is the proper way to brush your teeth?			> 0.9			> 0.9
Brushing the back, front and top of all teeth	29 (94%)	29 (97%)		30 (97%)	28 (100%)	
How do you move your toothbrush when brushing your teeth?			0.4			0.6
Circular motion	15 (48%)	11 (37%)		21 (68%)	17 (61%)	
When do you go to see your dentist for a check up and cleaning?			0.5			0.7
Every 6 months	28 (90%)	25 (83%)		29 (94%)	25 (89%)	

* Median (IQR); n (%)

* Wilcoxon rank sum test; Pearson's Chi-squared test; Fisher's exact test

Table 3 – Caregiver Responses for Oral Health Beliefs

	Caregiver Baseline Oral Health Beliefs			Caregiver Follow Up Oral Health Beliefs		
	Control, N = 31	Intervention, N = 30	p - value	Control, N = 31	Intervention, N = 30	p - value
Avoiding a lot of sweet foods			> 0.9			> 0.9
Important	22 (76%)	23 (77%)		22 (81%)	20 (80%)	
Using fluoride toothpaste			0.15			0.068
Important	16 (55%)	22 (73%)		18 (67%)	22 (88%)	
Visiting dentist regularly			0.6			0.6
Important	26 (90%)	28 (97%)		26 (96%)	22 (92%)	
Keeping the teeth and gums very clean			> 0.9			0.3
Important	27 (93%)	28 (93%)		26 (96%)	22 (88%)	
Drinking fluoridated water			0.03			0.003
Important	7 (24%)	15 (52%)		8 (30%)	17 (71%)	
Using dental floss			0.3			0.6
Important	22 (76%)	26 (87%)		26 (96%)	23 (92%)	
When should you brush your teeth?			> 0.9			> 0.9
In the morning when you wake up and at night when you go to sleep	28 (97%)	29 (97%)		26 (96%)	24 (96%)	
What is the proper way to brush your teeth?			> 0.9			0.1
Brushing the back, front and top of all teeth	26 (96%)	29 (97%)		27 (100%)	22 (88%)	
How do you move your toothbrush when brushing your teeth?			0.7			> 0.9
Circular motion	22 (76%)	24 (80%)		25 (93%)	23 (92%)	
When do you go to see your dentist for a check up and cleaning?			-			-
Every 6 months	29 (100%)	30 (100%)		27 (100%)	25 (100%)	

* Median (IQR); n (%)

* Wilcoxon rank sum test; Pearson's Chi-squared test; Fisher's exact test

Conclusions

- Comic book health instruction improved child and caregiver oral health beliefs/knowledge, but it demonstrated no superior effectiveness compared to verbal instructions alone.
- Plaque levels and oral health knowledge will be re-evaluated to assess sustained improvement at 6-month recall.
- Additional research is necessary to evaluate the long-term effects of comic book instruction on oral health literacy in children.



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