The Effect of Mobile App for improving Oral Hygiene in Children

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Introduction

Dental caries is a major global oral health problem affecting 60-90% of school-aged children. Despite being a preventable disease, it remains the most common chronic disease in children.

Innovative ideas have developed to encourage and educate children about proper tooth-brushing habits. Studying the effect of the mobile application ¨Disney Magic Timer¨ will help determine if applications used as an oral health educational approach help improve oral hygiene behavior in children, hence reducing plaque accumulation and decreasing the risk of dental caries.

Objective

To investigate the impact of two oral health education approaches: mobile application (Disney Magic Timer App) and conventional oral health education.

Materials and Methods

A pilot study of 5 subjects per group was completed to collect data for the sample size calculation of 28 subjects. 14 subjects were randomly assigned to each group. The investigator records the initial TQHPI (Turesky Modification of the Quigley-Hein Plaque Index) score and reviews the randomization sequence to determine if the subject will be in the control or experimental group. Plaque index will be obtained using disclosing solution. Subjects will be instructed on how to brush their teeth for 2 minutes using the standard care set of instructions. Difference in plaque index scores will be calculated by the Mann-Whitney U test.

The **experimental** group will brush their teeth using the Disney Magic Timer App on an iPad tablet. Then, the final TQHPI is taken. The **control** group will brush their teeth without the application. The final TQHPI is taken after. The total score is then divided by the number of tooth surfaces measured, giving us the TQHPIscore.

The Turesky score is then used to assess the patient's oral hygiene using the table below.

Fig. 1

0.0 – 1.0	Excellent oral hygiene
1.0 – 1.5	Good oral hygiene
1.5 – 2.0	Fair oral hygiene
2.0 – upwards	Poor oral hygiene

Turesky Modification of the Quigley-Hein Plaque Index

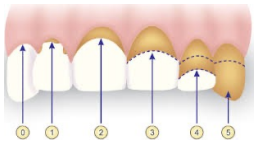
Fig. 2

Modified Plaque Scoring System of Turesky et al	Score
No plaque	0
Separate flecks of plaque at the cervical margin of the tooth	1
A thin continuous band of plaque (up to 1 mm) at the cervical margin of the tooth	2
A band of plaque wider than 1 mm covering less than one third of the crown of the tooth	3
Plaque covering at least one-third but less than two thirds of the crown of the tooth	4
Plaque covering two-thirds or more of the crown of the tooth	5

Fig. 3

Tooth #	Surface and Score (1-5)	TOTAL SCORE
3	M= D= L= F=	
A/4	M= D= L= F=	
B/5	M= D= L= F=	
C/6	M= D= L= F=	
D/7	M= D= L= F=	
E/8	M= D= L= F=	
F/9	M= D= L= F=	
G/10	M= D= L= F=	
H/11	M= D= L= F=	
I/12	M= D= L= F=	
J/13	M= D= L= F=	
14	M= D= L= F=	
19	M= D= L= F=	
K/20	M= D= L= F=	
L/21	M= D= L= F=	
M/22	M= D= L= F=	
N/23	M= D= L= F=	
O/24	M= D= L= F=	
P/25	M= D= L= F=	
Q/26	M= D= L= F=	
R/27	M= D= L= F=	
S/28	M= D= L= F=	
T/29	M= D= L= F=	
30	M= D= L= F=	
	DIVIDED BY NUMBER OF SURFACES SCORED:	

Fig. 4



Mobile Application

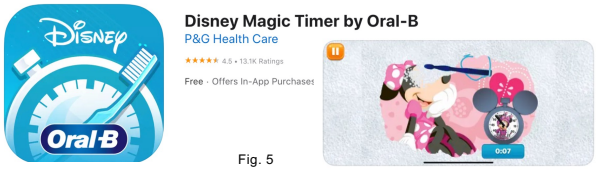


Fig. 5

Results

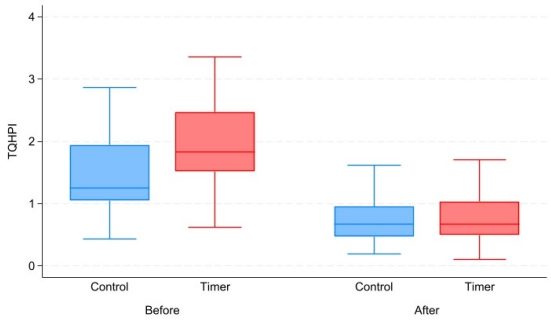


Fig. 6

Box plots of the plaque scores before and after brushing (N=28)

Results

- There is not a statistically significant difference in median TQHPI score 2 between groups (p = 0.94).
- There is a statistically significant difference in TQHPI Score 1 and 2 for the control group (p = 0.0001).
- There is a statistically significant difference in TQHPI Score 1 and 2 for the investigative group (p = 0.0001).

Discussion

The data collected reflected no statistically significant difference in the final plaque scores between the control and the experimental group. A significant difference is reflected in both final scores when compared to their own group's initial score meaning conventional toothbrushing for two minutes is effective for plaque removal.

The research team identified two main limitations to this study:

1. The inclusion criteria for age is too broad. Dexterity and skills are significantly different between 6-year-old and 10-year-old subjects.
2. Patients and parents reported brushing regularly with electric toothbrushes at home. Technique and ability can be significantly different between subjects who brush with a conventional or electric toothbrush.

Conclusion

The results of the study demonstrated no significant difference in plaque removal when using a mobile app and conventional toothbrushing technique in children 6 to 10 years old.

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