

Exploring Associations Between Physical Activity, Screen Time, and Early Childhood Caries

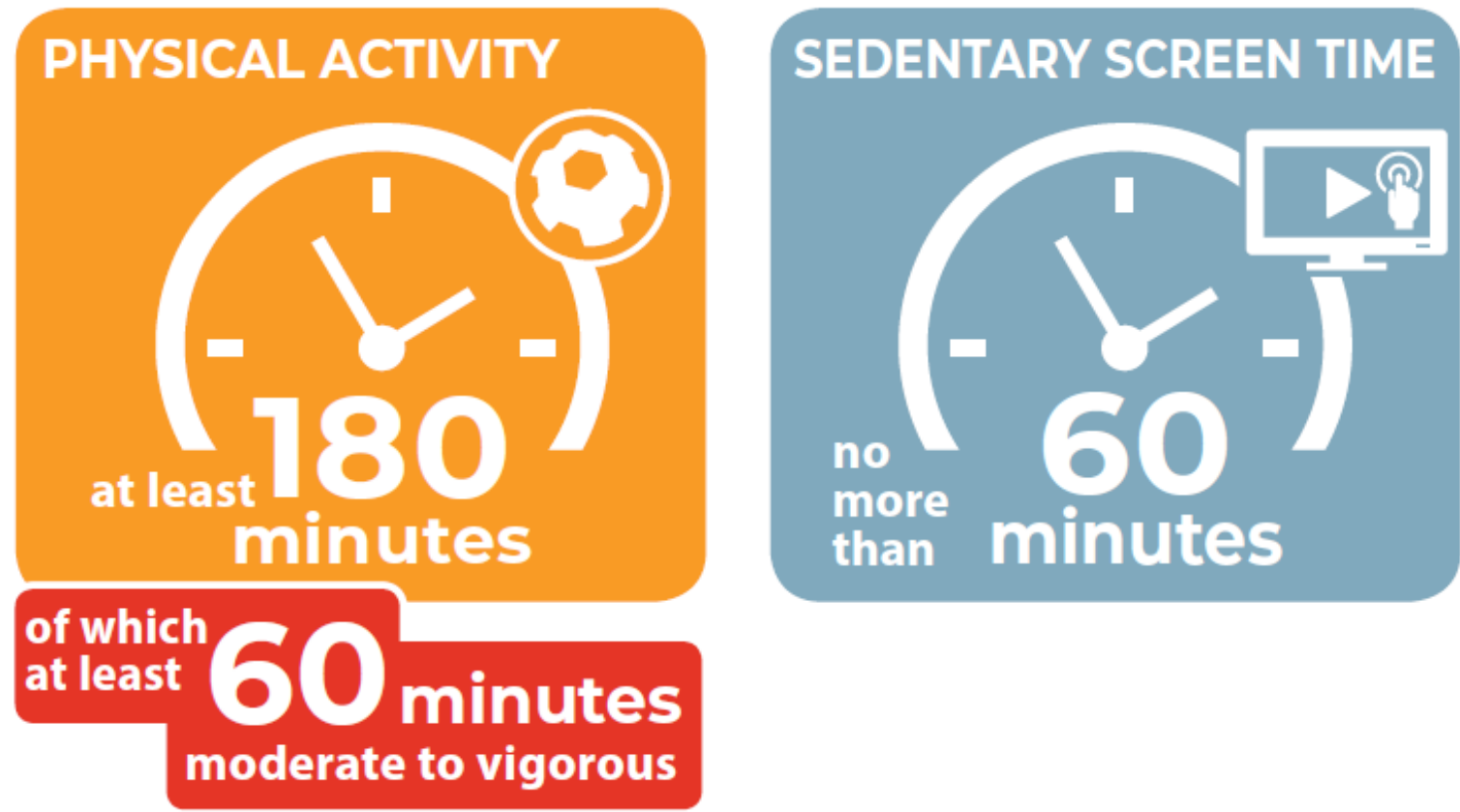
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Background

- Early childhood caries (ECC) - tooth decay in children under six years of age – is a preventable, chronic disease with significant public health impact
- Obesity and ECC share dietary behavioral risk factors, including frequent snacking and intake of excess dietary sugars
- Excessive screen time, including from television and computer use, has been linked to higher BMI and increased caries risk
- Screen time contributes to obesity by reducing physical activity, increasing calorie intake through concurrent snacking, and altering metabolism
- Parent behaviors, socioeconomic status, and the home environment have been shown to influence children's physical activity, screen time, and diet

Figure 1. WHO (3-4 years of age) Physical Activity Recommendations

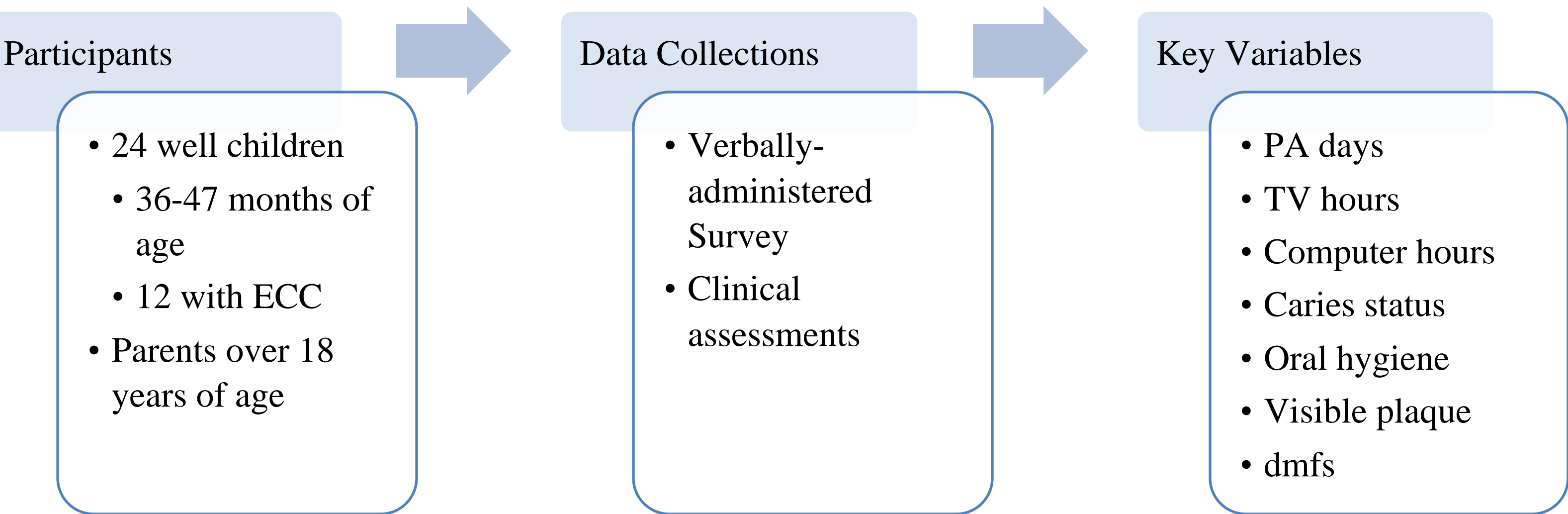


Purpose

To evaluate associations between physical activity, screen time, and clinical measures of early childhood caries among 3-year-old children as part of a pilot study exploring relationships between children's microbiome, oral health, and behavioral and environmental exposures

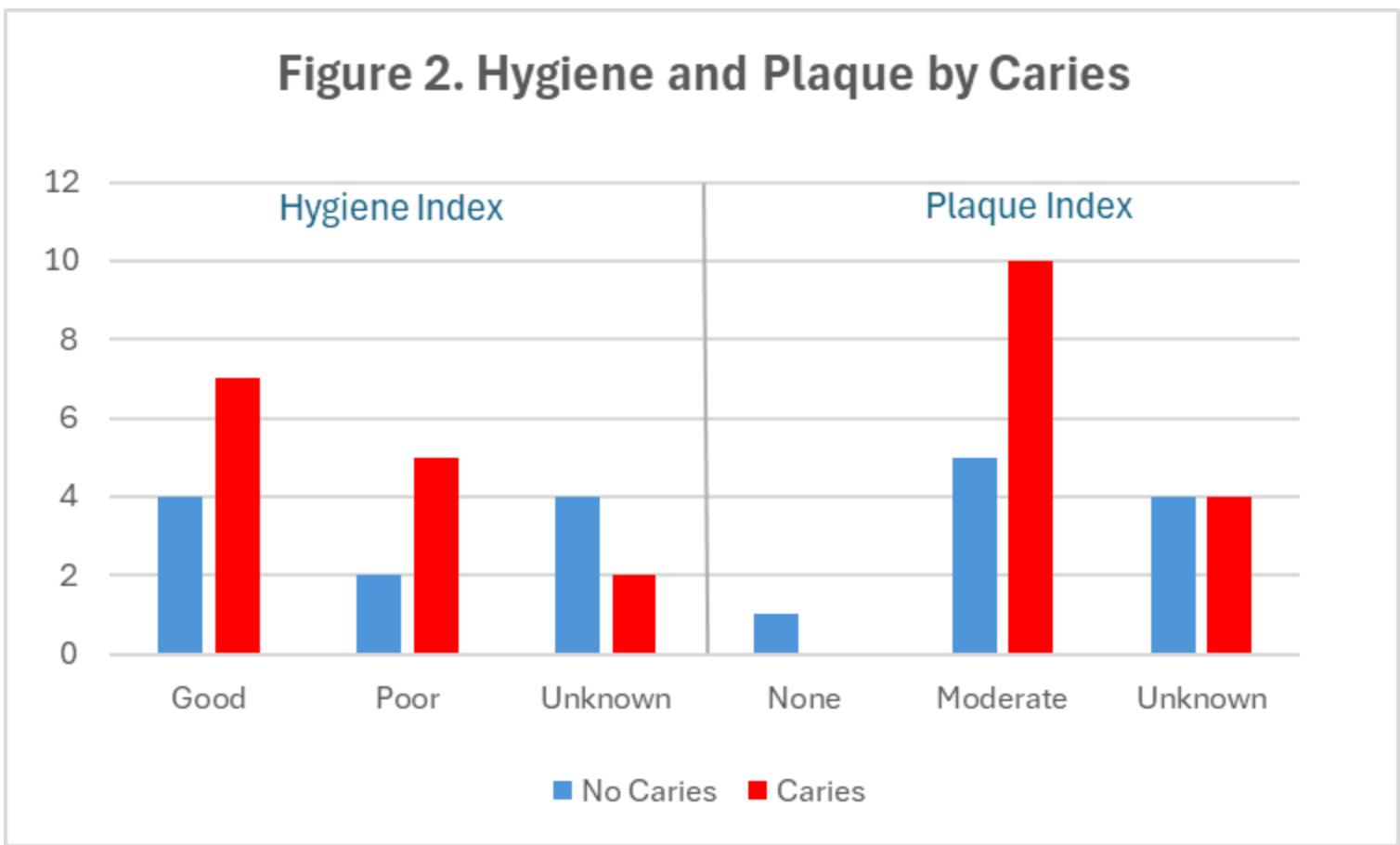
Methods

Twenty-four children (14 with ECC) and their parents/caregivers were recruited from the Columbia University pediatric dentistry clinic. A verbally-administered survey collected demographic, health history, and behavioral and environmental exposure data (e.g., height/weight, physical activity types/frequency/duration, screentime). Clinical measures charted during routine dental exams were abstracted from electronic health records, including caries status (total dmfs: *decayed, missing, filled tooth surfaces*), plaque index (*none, moderate, heavy*), and oral hygiene status (*poor, good, unknown*).

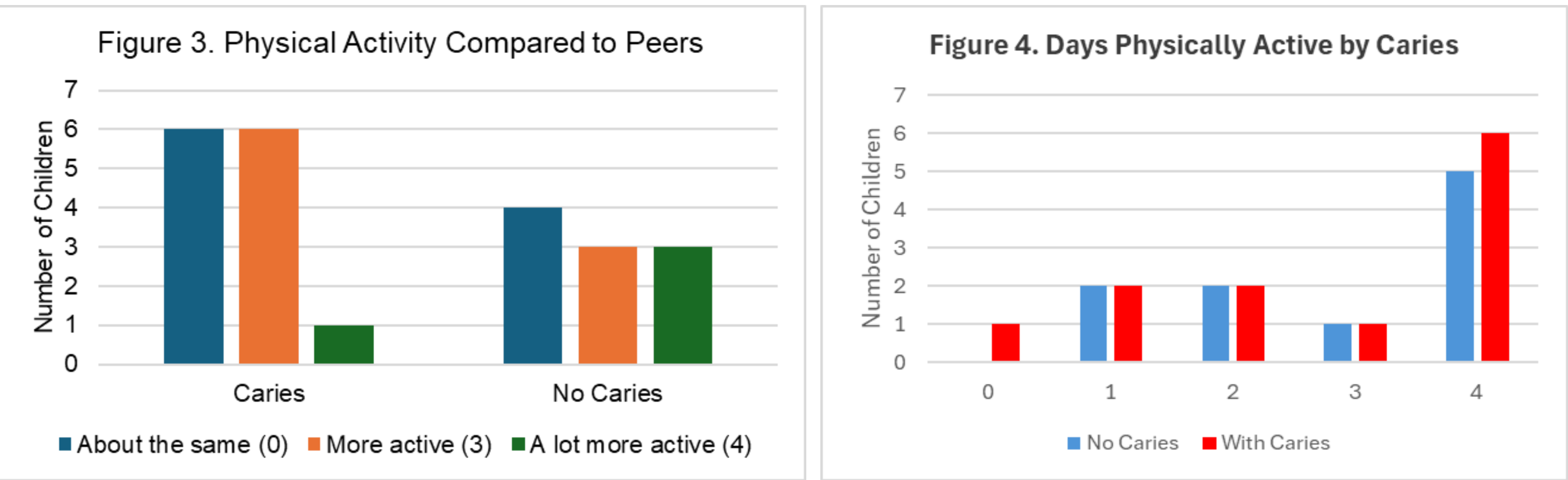


Findings

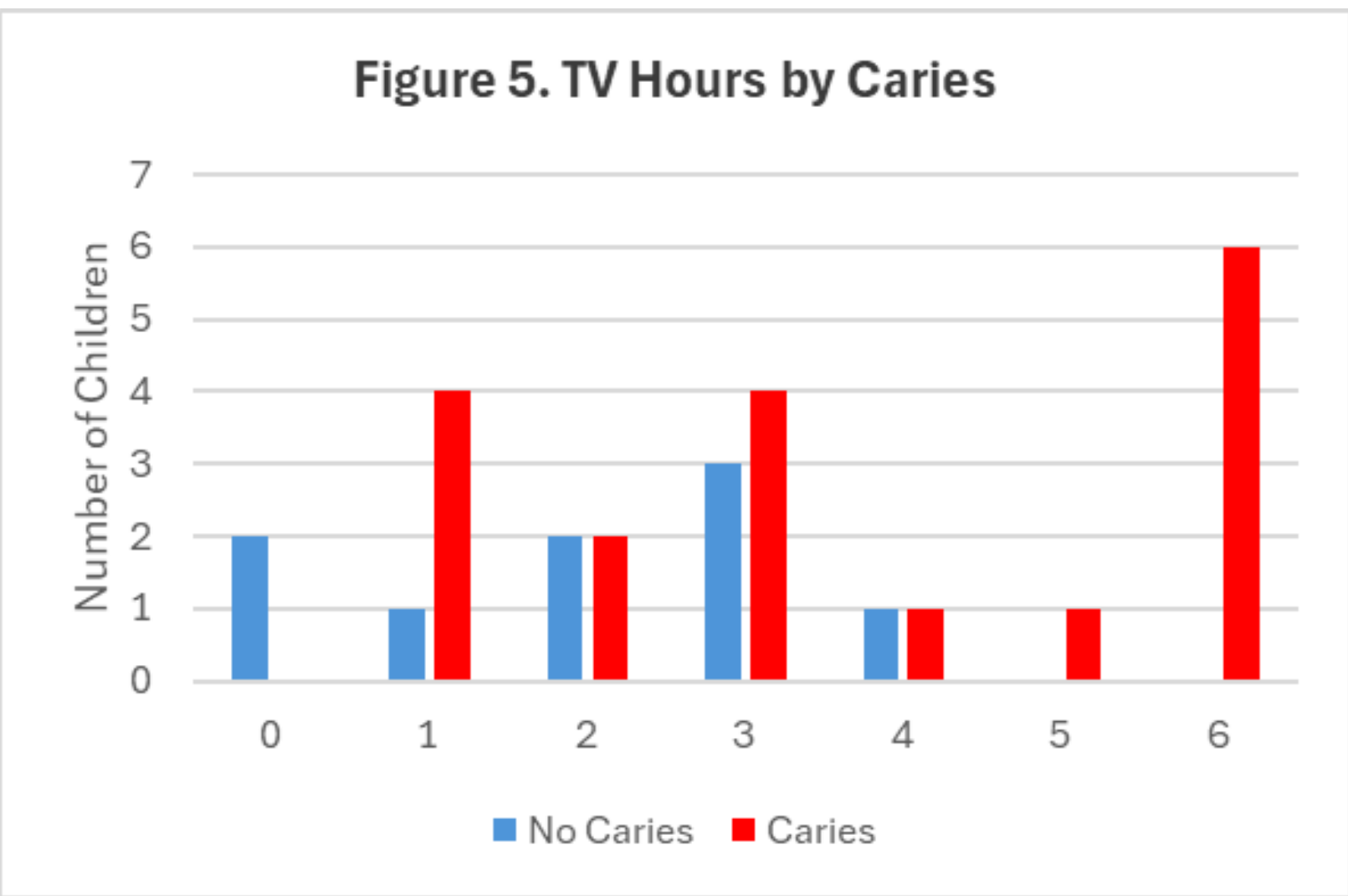
- Among 14 children with caries, mean dmfs=8.5 (range 1-26)
- Overall, 46% (n=11) of children had *good* oral hygiene; 29% (n=7) *poor*; and 25% (n=6) were not charted and were categorized as *unknown* (**Figure 2**)
- 63% (n=15) had *moderate* plaque levels; 4% (n=1) had *none*; and 33% (n=8) *unknown* (**Figure 2**)



- No parents reported physical/medical conditions affecting child's ability to be active
- Compared to peers, 40.9% (n=9) of parents responded their child's physical activity level was *about the same*; 40.9% (n=9) *more*; and 18.2% (n=4) *a lot more active*
 - Mean dmfs was 6.2 in the *about the same* group; 5.2 in the *more active* group; and 2 in the *a lot more active* group (**Figure 3**)
- Children were physically active (≥ 60 minutes) an average of 5 days (range: 2-7) within the last week: 5.4 in the caries group vs. 5.5 days in the caries-free group (p-value=0.92) (**Figure 4**)

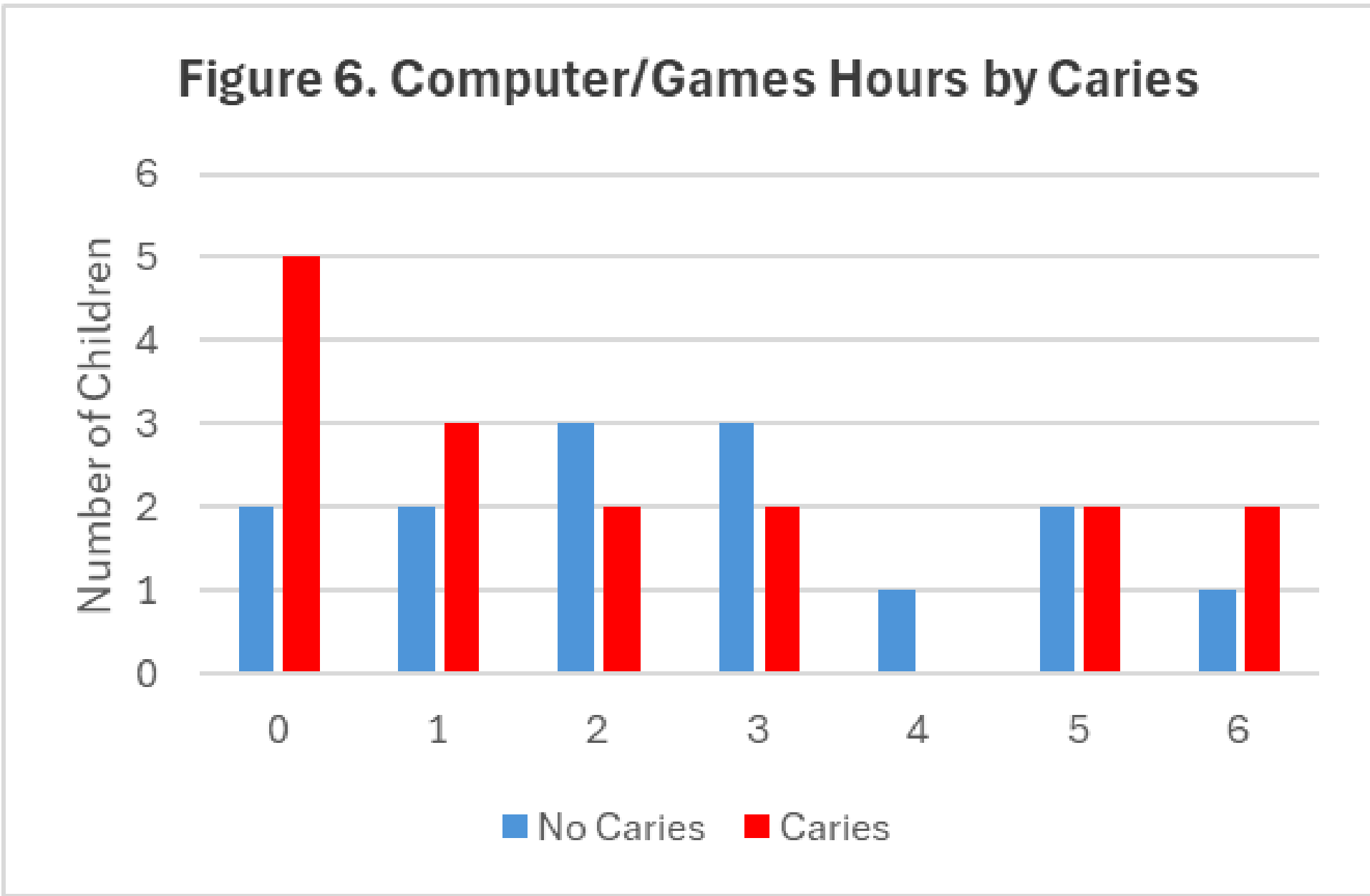


- Average daily TV hours was higher in the caries group at 2.8 hours per day vs. 2.3 hours in the caries-free group (p-value=0.52) (**Figure 5**)
- Among those with caries who reported watching television, mean dmfs was 5. The correlation between daily television hours and dmfs score was not statistically significant.



Findings (continued)

- Average daily Computer/Games hours was lower in the caries group at 1.62 hours per day vs. 2 hours in the caries-free group (p-value=0.52) (**Figure 6**)
- Among those with caries who reported computer/game use, mean dmfs was 3.4. The correlation between computer/game use and dmfs score was not statistically significant.



Limitations

- The small sample size may limit generalizability of findings and may not represent a true estimate of the population's daily physical activity and screen time
- Accuracy of physical activity and screen time use may be limited by parental recall
- Clinical measures were retrospectively abstracted from electronic health records, thus resulting in missing data for some measures (reported as *unknown*)
- The limited sample may have impeded ability to detect statistically significant differences in variables assessed

Discussion

- While physical activity and screen time alone may not directly influence dental caries, they play a role in overall health and can affect dental health, providing an opportunity for dental professionals to be engaged in holistic health recommendations for patients at a pivotal life stage
- Parental education and counseling regarding physical activity and screentime in the context of ECC may help to support healthy behaviors that are correlated with other diet-related diseases that impact overall health
- There are implications for chairside education regarding snacking behaviors during screen-time and sedentary activities that lower the risk for both caries and obesity
- Despite limitations in this small study, findings support dental providers' role in addressing the holistic health of patients and present an opportunity to be engaged in multi-morbidity prevention