

# EFFECTS OF ELECTRONIC GAMING ON THE ORAL HEALTH OF CHILDREN

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## Background

- > 90% of American children play electronic games
- Research suggests that electronic gaming (EG) is detrimental to overall and oral health
- Sedentary lifestyle, obesity, increased snacking, psychosocial problems
- Pontes' Internet Gaming Disorder Scale—Short Form (IGDS9-SF) is a commonly used tool worldwide:
  - Aligns with the criteria for Internet gaming disorder from the American Psychological Association
  - Validated on multiple levels
- There has been limited research investigating the effects of videogaming on the caries scores of children.

## Objective & Hypothesis

- Objective:** To investigate whether there is a correlation between EG and caries scores in children aged 12-17 years old
- Null Hypothesis:** Children who spend more time on EG do not have higher DMFT scores.
- Alternative hypothesis:** Children who spend more time on EG have higher DMFT scores.

## Methods

Participants were selected from the patient schedules at the study locations, and eligible children were asked to participate in this research study.

Study locations comprised of pediatric dental clinics in Chicago, Illinois that accept Medicaid dental insurance:

- UIC College of Dentistry, Department of Pediatric Dentistry
- Apple Dental Care

Inclusion	Exclusion
12-17 years old	No additional criteria.
ASA I or ASA II	
Comprehensive dental care patient at a study site	
Patient has sufficient English or Spanish reading literacy.	
Legally authorized representative has sufficient English or Spanish reading literacy.	

**Enrollment:** The child's legally authorized representative signed the consent, and the subject signed the assent.

**Participant Questionnaire:** Completed electronically via UIC Qualtrics

**Data Analysis:** Statistical analysis was completed using IBM SPSS software.

**UIC Institutional Review Board approved this study – Protocol Number 2022-0780.**

**PARTICIPANT QUESTIONNAIRE**

Part A:

- What is your full name? \_\_\_\_\_
- What is your date of birth?
  - Month: \_\_\_\_\_ Day: \_\_\_\_\_ Year: \_\_\_\_\_
- You are:
  - Male
  - Female
  - Rather not disclose
- How old were you when you first started to play electronic games?
  - Years: \_\_\_\_\_
- Do you own a mobile device or handheld gaming console that you use to play games?
  - Yes
  - No
- How many hours of electronic gaming do you play in a week?
  - less than 7 hours
  - 8-14 hours
  - 15-20 hours
  - 21-30 hours
  - more than 30 hours

Part B:

Instructions: These questions will ask you about your gaming activity during the past year (i.e., last 12 months). By gaming activity we understand any gaming-related activity that has been played either from a computer/laptop or from a gaming console or any other kind of device (e.g., mobile phone, tablet, etc.) both online and/or offline.

	Never	Rarely	Sometimes	Often	Very Often
1. Do you feel preoccupied with your gaming behavior? (Some examples: Do you think about previous gaming activity or anticipate the next gaming session? Do you think gaming has become the dominant activity in your daily life?)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Do you feel more irritability, anxiety or even sadness when you try to either reduce or stop your gaming activity?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Do you feel the need to spend increasing amount of time engaged gaming in order to achieve satisfaction or pleasure?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Do you systematically fail when trying to control or cease your gaming activity?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Have you lost interests in previous hobbies and other entertainment activities as a result of your engagement with the game?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Have you continued your gaming activity despite knowing it was causing problems between you and other people?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Have you deceived any of your family members, therapists or others because the amount of your gaming activity?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Do you play in order to temporarily escape or relieve a negative mood (e.g., helplessness, guilt, anxiety)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Have you jeopardized or lost an important relationship, job or an educational or career opportunity because of your gaming activity?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Results

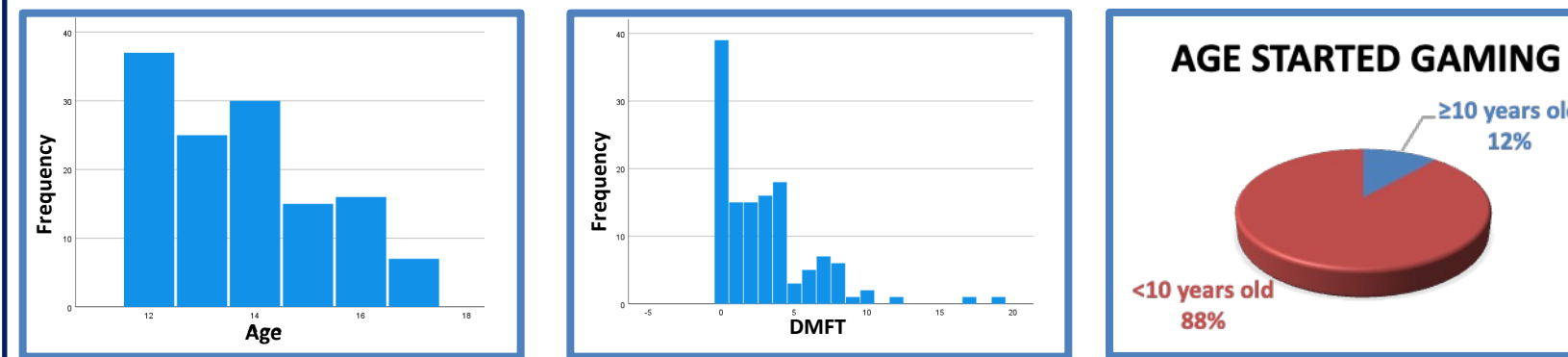
Data collection 09/02/2022 - 10/13/2022

137 questionnaires completed

- 6 questionnaire responses (incomplete responses)
- 1 questionnaire response (invalid answer)

Total = 130 questionnaires included for data analysis

Gender: 65 Males (50%), 64 Females (49.23%), 1 Rather not disclose (0.77%)



Participants ranged from 12 to 17 years old. Mean age = 13.76 years old (SD = 1.54 yrs)

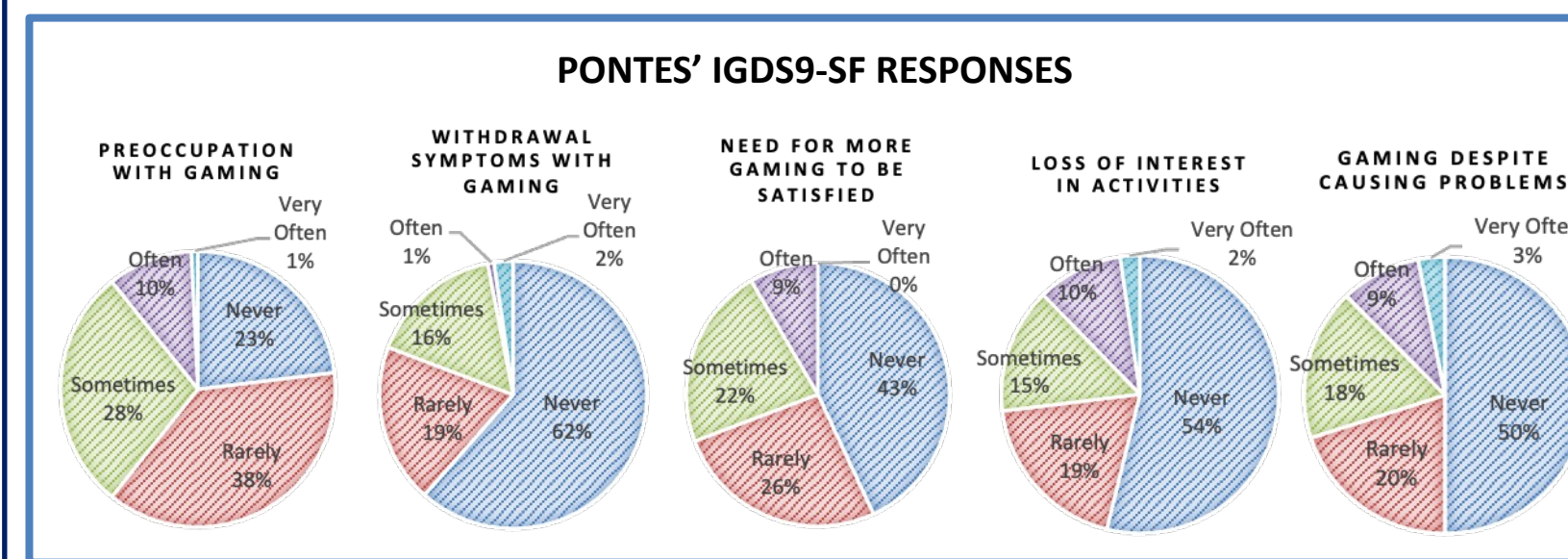
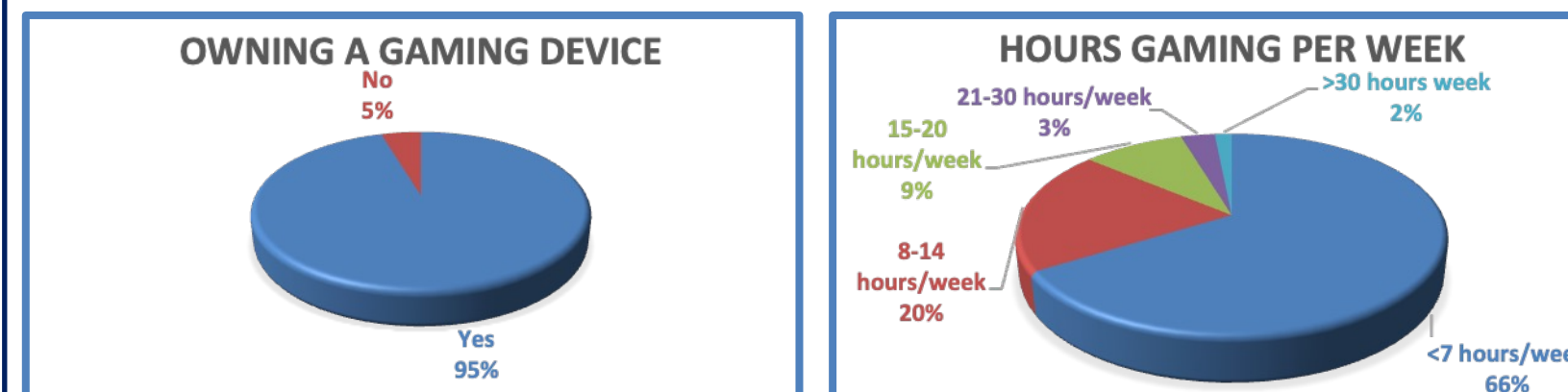


Table 1. Summary of Questionnaire Responses

Question	Response
Total score of Pontes' questionnaire (out of a total possible score of 45)	Mean = 16.57 (standard deviation = 5.77)
# Pontes' questionnaire questions scored at 5	0: 113 (86.92%)
	1: 11 (8.46%)
	2: 5 (3.85%)
	3: 0 (0.00%)
4: 1 (0.77%)	

Table 2. Gender vs. DMFT: Mann-Whitney U Test

DMFT	Ranks			
	Sexual Identity	N	Mean Rank	Sum of Ranks
Total	Male	65	60.94	3961.00
	Female	64	69.13	4424.00
Test Statistics <sup>a</sup>				
			DMFT	
Mann-Whitney U			1816.000	
Z			-1.265	
Asymp. Sig. (2-tailed)			.206	

<sup>a</sup> Grouping Variable: Sexual Identity.

Table 3. Spearman's Correlation of Pontes' Questionnaire and DMFT

Pontes' Questionnaire Questions	Rho	p value
1. Preoccupation with Gaming	-0.232**	0.008 **
2. Withdrawal symptoms with gaming	-0.016	0.852
3. Need for more gaming to be satisfied	-0.207*	0.018 *
4. Failure to reduce gaming	-0.194*	0.027 *
5. Loss of interest in prior hobbies due to gaming	-0.021	0.809
6. Gaming despite it causing problems	-0.086	0.330
7. Deception to others about gaming time	0.007	0.935
8. Gaming to escape negative emotions	0.012	0.890
9. Risking relationship or job for gaming	0.108	0.223

\*\* Correlation is significant at the 0.01 level (2-tailed).  
\* Correlation is significant at the 0.05 level (2-tailed).

Table 4. Spearman's Correlation of Predictors and DMFT

Predictors	DMFT	
	Rho	p value
Age when first started gaming	-0.047	0.592
Number of years gaming	0.020	0.817
Hours gaming per week	-0.095	0.280
Pontes' Questionnaire Total Score	-0.129	0.144

\*\* Correlation is significant at the 0.01 level (2-tailed).

- Most children scored at the lower end of Pontes' scoring system, which indicated that most of the participants were not severe gamers.
- No significant correlation was found between the following:
  - DMFT score and total response scores from Pontes' questionnaire
  - DMFT score and hours per week of gaming
  - DMFT score and number of years since first started gaming
  - DMFT score and gender
    - Females had higher DMFT scores but the correlation was not significant.
- Weakly negative correlations were found between the following:
  - DMFT score and preoccupation with gaming behavior
  - DMFT score and the need to increase gaming time to achieve satisfaction
  - DMFT score and the systematic failure to stop/control gaming

## Conclusions

- More time on EG is not associated with higher caries scores in children aged 12-17 years old
- The caries scores of adolescents are negatively and weakly correlated with:
  - Preoccupation with gaming behavior
  - The need to increase gaming time to achieve pleasure or satisfaction
  - Systematic failure to stop or to control gaming
- It is possible that adolescents who are highly preoccupied with gaming exhibit lower frequency in snacking in order to accommodate heavy gaming habits, possibly skipping meals, eating smaller meals, and having lesser appetites
- More research is needed on this topic