



School-level Contextual Factors in Relation to Severe Early Childhood Caries among Preschool Children: A Multilevel Analysis

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Background

Dental caries is the severe oral health issue among preschool children in Taiwan. According to the national caries prevalence of 5 years old Taiwanese children, it is shown that the oral health condition of preschool children remains below the standards set by the World Health Organization. Since preschool children spend much time in school, school-level contextual factors play an important role in school oral health promotion. This study is focused on broad social environmental factors associated with severe early childhood caries (SECC) among preschool children aged 3-5 years.

Objective

This study aims to explore school-level contextual factors associated with severe early childhood caries among preschool children aged 3-5 years.

Method

A cross-sectional study was conducted in 2014 in Taipei. Data were collected from a questionnaire administered by dentists, a dental clinical examination, and a dental radiograph questionnaire. The prevalence of SECC was defined as having a filled tooth ≥ 4 . The analysis was performed using multilevel logistic regression. The adjusted OR for children with SECC was 0.83, 95% CI (0.71-0.97) after adjusting for individual-level factors. The adjusted OR for schools located in the urban area was 0.75, 95% CI (0.61-0.92) after adjusting for school-level factors.

Conclusion

The specific school attended has a positive significant effect on the lower risk of having SECC. The findings suggest that effective strategies should be focused on health promoting environments in order to reduce caries development.

Table 1. Descriptive analysis of the preschool children according to individual and contextual level variables.

Characteristics	Number (n=9,794)		dmft≥1 (n=3,773)		SECC (n=725)	
	n	%	n	%	n	%
Individual level						
Age (Mean±SD)	4.78	0.47	4.81	0.38	4.86	0.37
Gender						
Female	4,654	47.32	1,765	46.78	353	48.69
Male	5,140	52.48	2,008	53.22	372	51.31
Sweets consumed						
less than once	1,826	18.64	544	14.42	83	11.45
2-5 times/week	4,997	51.02	1,909	50.6	354	48.83
more than once/day	2,971	30.33	1,320	34.99	288	39.72
Sugary beverages consumed						
less than once	5,603	57.21	1,906	50.52	315	43.43
2-5 times/week	3,534	36.08	1,529	40.52	320	44.14
more than once/day	657	6.71	338	8.96	90	12.41
Maternal educational level						
High school	1,014	10.93	526	14.82	165	24.54
College	8,266	89.07	3,023	85.18	553	75.66
Regular dental check-ups						
No	2,680	27.36	1,046	27.72	188	25.93
Yes, every 6 months	7,114	72.64	2,727	72.28	537	74.07
Contextual level						
Dental clinics (Mean±SD)	123.75	576.09	118.54	571.77	105.1	557.05
Health promotion community						
No	4,520	46.15	1,685	44.66	343	47.31
Yes	5,274	53.85	2,088	55.34	382	52.69
Preschool type						
Public	1,792	18.03	821	21.76	188	25.93
Private	8,002	81.7	2,952	78.24	537	74.07
Outdoor activities after school time						
No	7,492	76.5	2,933	77.74	562	77.52
Yes	2,302	23.5	840	22.26	163	22.48

Table 2. Association of severe early childhood caries and variables in preschool children.

Characteristics	Model 1		Model 2		Model 3		Model 4	
	aOR	95%CI	aOR	95%CI	aOR	95%CI	aOR	95%CI
Individual level								
Maternal educational level								
High school	0.34	(0.28-0.41)	0.36	(0.29-0.43)			0.39	(0.32-0.48)
College	1.61	(1.32-1.96)	1.59	(1.29-1.97)			1.58	(1.27-1.98)
Age								
Female	1.00		1.00		1.00		1.00	
Male	0.97	(0.82-1.10)	0.96	(0.82-1.13)	0.96	(0.82-1.13)	0.96	(0.82-1.13)
Sweets consumed								
less than once	1.00		1.00		1.00		1.00	
2-5 times/week	1.60	(1.25-2.05)	1.43	(1.09-1.87)	1.43	(1.09-1.87)	1.43	(1.09-1.87)
more than once/day	2.25	(1.75-2.90)	1.73	(1.31-2.29)	1.73	(1.31-2.29)	1.73	(1.31-2.29)
Sugary beverages consumed								
less than once	1.00		1.00		1.00		1.00	
2-5 times/week	1.67	(1.42-1.96)	1.53	(1.28-1.82)	1.53	(1.28-1.82)	1.53	(1.28-1.82)
more than once/day	2.66	(2.08-3.42)	2.14	(1.62-2.82)	2.14	(1.62-2.82)	2.14	(1.62-2.82)
Regular dental check-ups								
No	1.00		1.00		1.00		1.00	
Yes, every 6 months	0.82	(0.78-1.10)	0.81	(0.67-0.97)	0.81	(0.67-0.97)	0.81	(0.67-0.97)
Contextual level								
Dental clinics	0.995	(0.994-0.996)			0.995	(0.99)		
Health promotion community								
No	1.00				1.00		1.00	
Yes	1.05	(0.96-1.22)			0.79	(0.61-1.02)	0.79	(0.61-1.02)
Preschool type								
Public	1.00				1.00		1.00	
Private	0.61	(0.52-0.73)			0.66	(0.55-0.79)	0.66	(0.55-0.79)
Outdoor activities after school time								
No	1.00				1.00		1.00	
Yes	1.06	(0.89-1.27)			0.94	(0.77-1.14)	0.94	(0.77-1.14)

