Factors associated with early initiation of e-cigarette use and its impacts on e-cigarette smoking behavior

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Background

- The increasingly young electronic cigarette userbase is extremely concerning.
- In particular, the percentage of Hong Kong Primary 2 to 4 pupils who had tried e-cigarettes increased by 55% from 2016/17 to 2017/18.
- Early initiation of e-cigarettes can have serious impacts on short-term and long-term health
- There is a pressing need to investigate the underlying factors of this worrying trend and its impacts on e-cigarette smoking behaviour.

Objectives

- To assess the factors associated with early initiation of e-cigarette usage in primary school and its impact on e-cigarette smoking behavior

Methods

- Sociodemographic characteristics and e-cigarette smoking behaviour were summarized using descriptive statistics.
- Adjusted odds ratios (AOR) were calculated using logistic regression, adjusting for age, sex, place of birth, perceived family affluence, parental education, housing type
- SPSS Statistics 25 was used for analysis

Methods

- Design: Cross-sectional study
- Data source: Hong Kong Secondary School Smoking and Health Survey 2014/15 by School of Public Health, University of Hong Kong
- Subjects: **787** Hong Kong secondary school e-cigarette users who completed the Hong Kong Secondary Smoking and Health Survey regarding the age of smoking their first e-cigarette puff
- Outcome measure: early initiation of e-cigarette smoking - defined as those who had their first e-cigarette puff at 11 years old or younger (primary school age)
- Potential factors associated with early initiation:
  i) Sociodemographic: sex, place of birth, perceived family affluence, parental education level, housing type
  ii) Reasons for using e-cigarettes: Family member use, friends, curiosity, like the flavors, trendy and attractive, easy to use unnoticed, convenient, cheaper, want to quit/reduce smoking, less harmful, other reasons
- E-cigarette smoking behavior: current use (use in past 30 days), frequent use (use > 20 days in past 30 days), nicotine content, flavors, concurrent use of other tobacco products

Results

Table 1. Age of Smoking the First E-cigarette Puff

Age (years)	n	%
≤ 7	39	5.0%
8	28	3.6%
9	37	4.7%
10	44	5.6%
11	65	8.3%
12	93	11.8%
13	131	16.6%
14	145	18.4%
15	102	13.0%
≥ 16	103	13.1%
Total	787	100.0%

AGE OF SMOKING THE FIRST E-CIGARETTE PUFF

Bar chart values: ≤7: 39, 8: 28, 9: 37, 10: 44, 11: 65, 12: 93, 13: 131, 14: 145, 15: 102, ≥16: 103

Table 2. Factors Associated with Early E-cigarette Use in Children ≤11 y/o

Socio-demographic Information	AOR (95% CI)
Male Sex	1.884 (1.242-2.858)*
Born in Hong Kong	0.962 (0.593-1.562)
Above average perceived family affluence	2.650 (1.142-6.150)*
Education level	
Father below secondary education	1.074 (0.712-1.621)
Mother below secondary education	1.591 (0.922-2.746)
Housing	
Private	1.000
Public/Subsidized	0.539 (0.265-1.093)
Temporary/Other	0.658 (0.339-1.277)

Table 3. Reasons for Early Uptake of E-Cigarettes in E-Cigarette Users ≤11 y/o

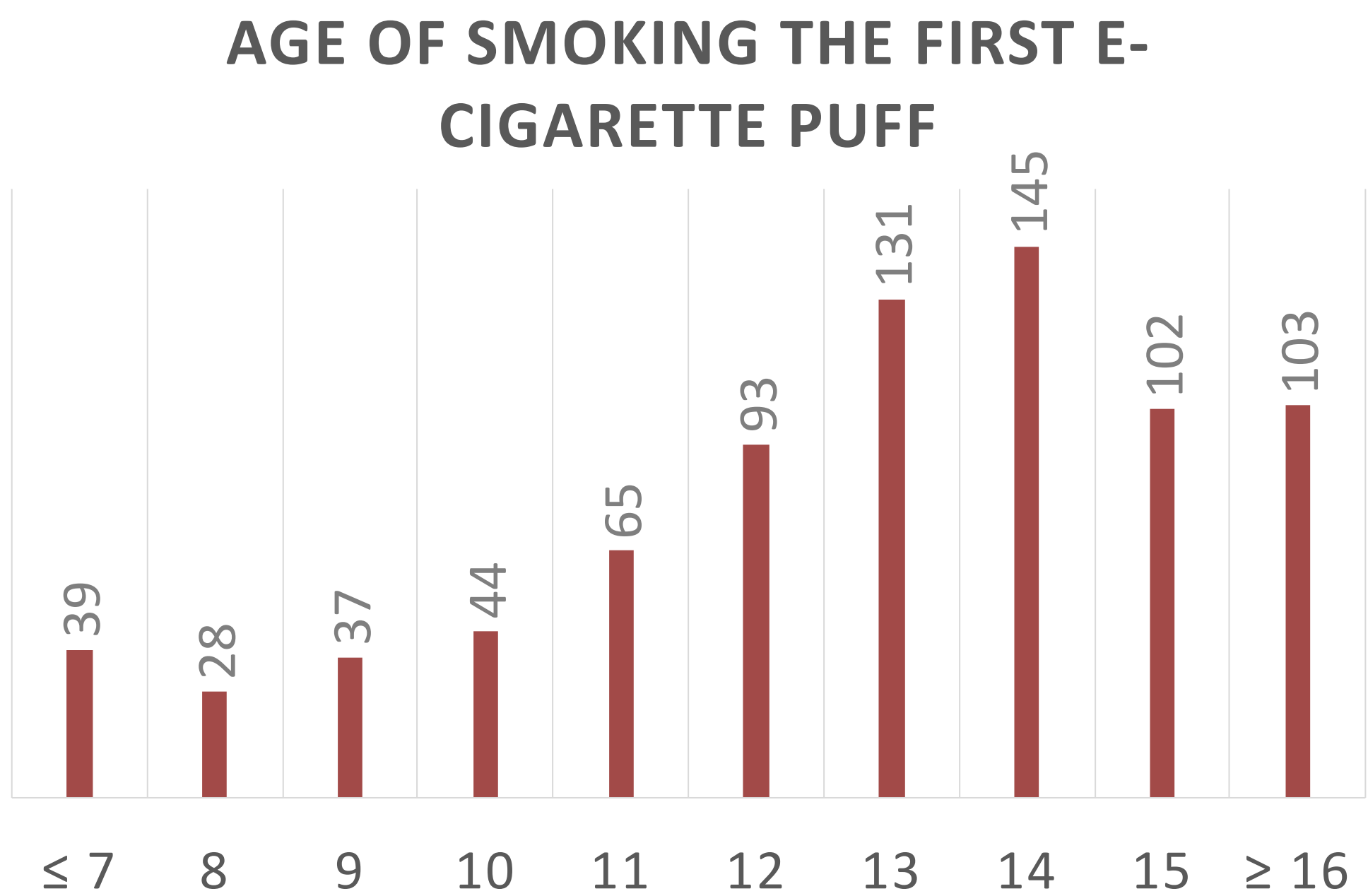| Reasons	p-value from χ^2 test	AOR (95% CI)
Family also use	.000*	8.691 (3.876-19.487)*
Friends also use	0.209	0.709 (0.460-1.092)
Curious	.001*	0.540 (0.360-0.811)*
Like the flavours	.000*	0.530 (0.331-0.848)*
Chic/attractive	0.121	0.786 (0.459-1.346)
Easy to use unnoticed	.011*	2.119 (1.126-3.989)*
Convenient	0.084	1.491 (0.785-2.832)
Cheaper	.033*	2.039 (0.947-4.386)
Want to quit/reduce smoking	0.28	1.311 (0.615-2.793)
Less harmful	0.245	0.874 (0.489-1.561)
Other reasons	0.723	0.829 (0.397-1.734)

Table 4. Impact of Family Member E-Cigarette Use on Early E-Cigarette Initiation (≤11 y/o)

Family member e-cigarette use	First Puff >11y/o (%)	First Puff ≤11 y/o (%)	AOR (95% CI)
Father	72.1%	49.3%	8.102 (3.747-17.516)*
Mother	82.8%	59.2%	40.192 (8.823-183.094)*
Siblings	5.7%	19.2%	3.727 (1.948-7.132)*
Other relatives/Maid	2.4%	12.2%	9.148 (3.694-22.657)*
None	1.4%	7.0%	0.121 (0.074-0.197)*

Table 5. E-Cigarette Patterns of Use in Early Users (≤11 y/o)

E-Cigarette Patterns of Use	First Puff >11y/o (%)	First Puff ≤11 y/o(%)	AOR (95% CI)
Number of days of e-cigarette use in the past 30 days			
0 day	80.3%	42.7%	1.000
1 - 9 days	14.6%	37.6%	5.628 (3.402-9.311)*
10 - 19 days	1.9%	8.0%	16.179 (5.306-49.334)*
>20 days	3.1%	11.7%	9.988 (3.850-25.912)*
Use of other tobacco products in the past 30 days			
No	66.9%	46.5%	
Yes	33.1%	53.5%	2.848 (1.833-4.351)*
Nicotine-containing e-cigarettes			
Do not contain	22.6%	16.7%	1.000
Contain nicotine	18.0%	36.8%	2.270 (1.248-4.128)*
Do not know	47.0%	34.0%	0.880 (0.498-1.554)
Flavours of e-cigarettes			
Spice	3.1%	5.2%	4.141 (1.495-11.469)*
Coffee	27.0%	23.5%	3.979 (2.282-6.936)*
Tobacco	16.6%	17.4%	3.150 (1.461-6.793)*
Alcohol	2.1%	6.1%	1.902 (0.885-4.087)
No Flavour	5.4%	9.4%	1.333 (0.499-3.562)
Candy	4.4%	11.7%	1.005 (0.601-1.681)
Mint	8.0%	23.5%	0.796 (0.503-1.259)
Others	10.3%	8.0%	0.723 (0.360-1.451)
Fruits	65.7%	39.9%	0.388 (0.256-0.589)*

Conclusions

- Male sex and above average socioeconomic status significantly increased odds of having the first puff of e-cigarettes before 12 years old.
- E-cigarette use in family members was the most significant reason for early use, especially mothers and other adult family members
- Those who started early were more likely to have used e-cigarettes in the past 30 days, use more frequently, use nicotine-containing e-cigarettes and other tobacco products.
- Early users were significantly more likely to use flavors typically preferred by adults (e.g. tobacco and spice), and were less likely to use flavors preferred by most young people (e.g. fruits and mint)
- This suggest that adult e-cigarette use has substantial spillover effects on their own children, as well as other young relatives.
- This supports the need for e-cigarette control in Hong Kong