

An Investigation of Fruits and Vegetables Consumption among University Students in Hong Kong

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Background

“2 Plus 3 a day” diet campaign

- Objective: raise public’s awareness to meet the minimum daily fruits and vegetables consumption
- **2** portions of fruits & **3** portions of vegetables

Situation

- 81% of people aged 18 – 64 do not have adequate daily consumption
- Underlying determinants are much less investigated



Aims & Objectives

- Understanding the determinants of fruits and vegetables consumption behavior among university students in Hong Kong
- Explaining preferences and reasons for consumption
- Providing insights to raise university students' awareness and to provide recommendations



Literature Review

Common determinants were divided into four main groups:

- 1. Socio-demographic factors**
- 2. Personal factors**
- 3. Family-related factors**
- 4. Other factors: e.g. time, media**



Methodology

Target Respondents

- Students aged 18 or above
- Speak Cantonese among different local Hong Kong universities

Sampling and Data Collection

- Anonymous cross sectional in-person survey
- Conducted from Oct 25 to Nov 20, 2015
- 600 university students; 95.5% response rate

Questionnaire Design

Four main areas:

- (i). Consumption behavior
- (ii). Likelihood of consumption
- (iii). Knowledge of fruits and vegetables
- (iv). Tendency to gather information

Statistical Analysis

- SPSS for Windows version 23.0
- P-value < 0.05 was taken as statistically significant



Results

Table 1. Demographic data of university students; Consumption behavior of university students (n = 600) on daily consumption frequency and amount of fruits and vegetables were categorized by gender and faculty. 14 major disciplines were induced into 3 faculties: Sciences, Arts and Commerce

Demography Measurements	Gender		Faculty		
	Male	Female	Sciences	Arts	Commerce
n (% of Total)	260 (43.3)	340 (56.7)	226 (37.7)	261 (43.5)	113 (18.8)
Frequency^a					
< 1 time/day	9 (3.5)	6 (1.8)	6 (2.7)	9 (3.4)	0 (0)
1 time/day	124 (47.7)	165 (48.5)	103 (45.6)	129 (49.4)	57 (50.4)
2 times/day	79 (30.4)	129 (37.9)	80 (35.4)	87 (33.3)	41 (36.3)
3 times/day	23 (8.8)	30 (8.8)	16 (7.1)	24 (9.2)	13 (11.5)
4 times/day	10 (3.8)	3 (0.9)	5 (2.2)	8 (3.1)	0 (0)
≥ 5 times/day	15 (5.8)	7 (2.1)	16 (7.1)	4 (1.5)	2 (1.8)
Amount^b					
< 1 Portion/day	16 (6.2)	19 (5.6)	13 (5.8)	19 (7.3)	3 (2.7)
1-4 Portions/day	202 (77.7)	273 (80.3)	181 (80.1)	196 (75.1)	98 (86.7)
5-7 Portions/day	40 (15.4)	46 (13.5)	32 (14.2)	42 (10.6)	12 (10.6)
> 7 Portions/day	2 (0.8)	2 (0.6)	0 (0)	4 (1.5)	0 (0)

^a There are differences in between gender and frequency ($\chi^2 = 15.65, P < .01$), as well as faculty and frequency ($\chi^2 = 21.25, P < .05$)

^b There are no differences in between gender and amount ($\chi^2 = 0.63, P > .05$), as well as faculty and amount ($\chi^2 = 11.13, P > .05$)

Consumption Behavior

- Frequency
 ≤1time/day : 50.7%
 2 times/day: 34.7%
- Amount
 <5 portions: 85.0%

* Female showed higher frequency of consumption than male



Results

Table 2. Perceptions of university students (n = 600) on their sufficient consumption of fruits and vegetables, compared to actions on the consumption amount. These are tabulated into gender and faculty to analyze

Demographic Perception	Gender				Faculty						Total	
	Male ^b		Female ^c		Sciences ^d		Arts ^e		Commerce ^f		Yes	No
Measurements	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
n (% of Total)	135 (51.9)	125 (48.1)	148 (43.5)	192 (56.5)	105 (46.5)	121 (53.5)	133 (51.0)	128 (49.0)	45 (39.8)	68 (60.2)	283 (47.2)	317 (52.8)
Amount												
< 1 Portion/day	4 (3.0)	12 (9.6)	2 (1.4)	17 (8.9)	3 (2.9)	10 (8.3)	3 (2.3)	16 (12.5)	0 (0)	3 (4.4)	6 (2.1)	29 (9.1)
1-4 Portions/day	99 (73.3)	103 (82.4)	101 (68.2)	172 (89.6)	77 (73.3)	104 (86)	88 (66.2)	108 (84.4)	35 (77.8)	63 (92.6)	200 (70.7)	275 (86.8)
5-7 Portions/day	32 (23.7)	8 (6.4)	4 (29.1)	3 (1.6)	25 (23.8)	7 (5.8)	40 (30.1)	2 (1.6)	10 (22.2)	2 (2.9)	75 (26.5)	11 (3.5)
> 7 Portions/day	0 (0)	2 (1.6)	2 (1.4)	0 (0)	0 (0)	0 (0)	2 (1.5)	2 (1.6)	0 (0)	0 (0)	2 (0.7)	2 (0.6)

^a There are differences in between perception and action ($\chi^2 = 72.89$, $P < .01$) in general

^b There are differences in between perception of males and consumption amount ($\chi^2 = 20.12$, $P < .01$)

^c There are differences in between perception of females and consumption amount ($\chi^2 = 62.44$, $P < .01$)

^d There are differences in between perception of students in Sciences and consumption amount ($\chi^2 = 16.87$, $P < .01$)

^e There are differences in between perception of students in Arts and consumption amount ($\chi^2 = 45.24$, $P < .01$)

^f There are differences in between perception of students in Commerce and consumption amount ($\chi^2 = 12.16$, $P < .01$)

Perception & Action

- Perceived enough
- Action:
 - <1 portions/day: 2.1%
 - 1-4 portions/day: 70.7%
 - 5-7 portions/day: 26.5%
- Perceived insufficient
- Action:
 - <1 portions/day: 9.6%
 - 1-4 portions/day: 86.6%
 - 5-7 portions/day: 3.5%



Results

Likelihood of Consumption

- Health: 80%
- Taste: 41%
- Family: 30%
- Keep Fit: 17%
- Social: 8%

Top Reasons of Less Preference

- Taste
- Texture
- Depends on cooking method

Knowledge on Minimum Consumption & Action

- Knowledge: 1-4 portions
- Action:
 - 1-4 portions/day: 87.8%
 - 5-7 portions/day: 3.8%
- Knowledge: 5-7 portions
- Action:
 - 1-4 portions/day: 74.6%
 - 5-7 portions/day: 20.7%

Tendency of gathering more information

- 5-point Likert Scale
- $3.50 \pm .80$ (Mean \pm SD)



Discussion

Consumption Behavior

- Most of the participants did not reach the **minimum consumption** of 5 portions of fruits and vegetables per day
- Most of the participants did not consume fruits or vegetables for **every meal** during the day
- Most of the participants knew that they were consuming an insufficient amount of fruits and vegetables, but they **did not do anything to change** that

Recommendations

- Promoting increase in frequency of consumption during **every meal**, instead of consumption amount only
- More efforts can be focused on **encouraging male to consume fruits and vegetables** during each meal
- Focus efforts in promoting **family unit to have a higher availability of fruits and vegetables at home**
- Increasing the **diversity of fruits and vegetables choices**, as well as cooking methods



Discussion

Likelihood of Consumption

- **Taste preference** was the most positively related to the likelihood of consumption
- **Eating outside** frequently is significantly associated with insufficient consumption of fruit and vegetables
- **Availability and accessibility** are general lower in outside settings

Recommendations

- Better to have **habitual changes in earlier life** for less developed taste preference
- **Restaurants**, as well as **cafeterias in universities**, are encouraged to **provide more options**
- University students are also **encouraged to carry fruits in bags**



Discussion

Knowledge

- **Awareness** of the “2 Plus 3 a day” campaign among university students were rather low
- **Nutrition education program** could increase fruits and vegetables consumption

Health Promotion Effects

- Participants are **likely to gather more health information** after completing the survey
- Conducting questionnaire could potentially **raise participants’ awareness**

Recommendations

- **Raise the awareness of consuming sufficient fruits and vegetables** among university students, e.g. health talks or events
- Universities could **incorporate appropriate concepts into their existing curricula**

Recommendations

- **Health promotion** campaigns could be promoted along **with scientific health researches**



Conclusion & Recommendations

Recommendations were provided to increase university students' engagement in sufficient intake of fruits and vegetables:

1. Increasing the *Availability and Accessibility* of fruits and vegetables on *Campus*
2. Promoting Usage of Fruits and *Vegetables Containers*



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Thank you!

Q & A

