Promoting healthy eating to adolescents in Hong Kong: A school-based health intervention

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Agenda

- Background information
- Overview of the programme
- Preparatory phase study
- Intervention and activities
- Result and evaluation
- Discussion (Q&A)
Background Information

- Project Team
- Partner School
- Needs assessment
Project Team

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Partner School

- Buddhist Tai Hung College
  - located in Sham Shui Po
  - subsidized co-educational secondary school
  - 954 students from S.1 – S.6

(http://www2.bthc.edu.hk/CustomPage/paragraphGroup.aspx?ct=customPage&webPageId=1&pageId=1&nnnid=3)
Background

- Poor eating habit and unhealthy food pattern are major public health concern as they can induce cardiovascular and endocrinal diseases (Traill et al., 2011)

- Secondary school students tend to have a higher incidence to suffer from eating disorders (Lee & Lee, 2000), and find healthy eating boring and non-enjoyable (Chan et al., 2009)

- In school years, it is important for students to learn establishing a healthy eating habit and know how to choose their food intelligently. This can enable them to lead a healthy life till adulthood

- Schools – as another key place for adolescents’ socialization other than homes – are the good arena for giving healthy eating education to adolescents in a sustainable manner. Students can exercise and sustain healthy eating decisions more easily with the support from schools (Pittman et al., 2011)

- Family (parents in particular) and peers are shown to be remarkable in influencing adolescents’ eating habits (Rhoades et al., 2011; Al-Shookri et al., 2011; Chan et al., 2009)
Needs assessment

- Data from the Student Health Service of Department of Health - its students showed diet-related problems:
  1. Lower than normal BMI
  2. Skipping breakfast

- Data from the School’s observation:
  1. lack of energy among students in the morning classes
  2. fainting cases were common in morning assembly

A programme promoting healthy eating was therefore implemented to enable students building up a healthy eating habit
Overview of the Programme

- The logic model
# The Logic Model

<table>
<thead>
<tr>
<th>Inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human resources</td>
</tr>
<tr>
<td>Equipment</td>
</tr>
<tr>
<td>Materials</td>
</tr>
<tr>
<td>Money</td>
</tr>
<tr>
<td>Venues</td>
</tr>
<tr>
<td>Time</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activities</th>
<th>Outputs</th>
<th>Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase 1</strong></td>
<td>Students from Buddhist Tai Hung College (mainly F.1 and F.4)</td>
<td>Parents</td>
</tr>
<tr>
<td>Self-report food diary</td>
<td>Teachers</td>
<td></td>
</tr>
<tr>
<td>Focus group interviews</td>
<td>67 valid food diaries were collected in phase 1 and 45 in phase 2</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 2</strong></td>
<td>Six F.1 student and six F.4 students participated in the focus group interview in phase 1</td>
<td></td>
</tr>
<tr>
<td>3 Health talks for students</td>
<td><strong>Short</strong></td>
<td></td>
</tr>
<tr>
<td>1 Health talk for parents</td>
<td>To understand the eating behaviors and eating cultures of the students in the participating School.</td>
<td></td>
</tr>
<tr>
<td>Healthy eating public service advertisement (PSA) design competition</td>
<td>To understand the perceptions on healthy eating among the students of the participating School.</td>
<td></td>
</tr>
<tr>
<td>PSA shooting and production</td>
<td>Students of the participating School are encouraged in adopting a healthy eating habit, and to communicate their healthy eating experiences with their peers and their families.</td>
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</tr>
<tr>
<td>Healthy cooking workshop</td>
<td>To examine the factors affecting the choice of healthy and unhealthy food among students of the participating School.</td>
<td></td>
</tr>
<tr>
<td>Healthy eating project</td>
<td>To facilitate the building up of a healthy eating culture among the students of the participating School, and to extend this culture to their families.</td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td>To identify the perceived difficulties and barriers encountered by the students of the participating School in adopting a healthy eating habit.</td>
<td></td>
</tr>
<tr>
<td>Self-report food diary (pre-post)</td>
<td><strong>Medium</strong></td>
<td></td>
</tr>
<tr>
<td>Focus group interviews</td>
<td>To facilitate the creation of a healthy eating atmosphere within families and thus a healthy eating habit among adolescents.</td>
<td></td>
</tr>
</tbody>
</table>

**Long**
Preparatory Phase Study

- Self-report food diary
- Focus group interviews
- Results
Self-report Food Diary

Method

• Students were required to record:
  - the food and drinks they have consumed
  - at breakfast, snack, lunch, afternoon tea, dinner and late night food
  - their meal partners
  - for a consecutive 3-school day period
  - why on school days?
    1. enable the understanding of influence from peers
    2. the most common schedule for students

• Random sampling: One class from S.1 and one class from S.4
• Sample size: 67 students, including 33 S.1 and 34 S.4 students
• Duration: 4th-6th March 2015
• Descriptive Statistics: SPSS 20
• Content Analysis: Counting the frequency of keywords related to fibre food appeared in the food diary
Focus Group Interviews

Method

- Two focus group interviews were respectively conducted on 6 March 2015 and 13 March 2015
- One group S.1 students; another group S.4 students
- 3 female students and 3 male students in each group
- Random sampling

→ Obtain in-depth data and clarification from students that cannot be obtained from self-report food diary
Results

- Skipping breakfast
  - Only 42% of S.1 students had breakfast everyday
  - 24% of S.1 students never had breakfast
  - only 35% of S.4 students had breakfast everyday
  - 17.6% of S.4 students never had breakfast

- parents had a significant role → most ate with parents and/or siblings
• Skipping lunch
  - 12.5% of S.1 students skipped lunch
• Skipping dinner

- 12% of S.1 students skipped dinner once
- 12% of S.4 students skipped dinner once
What did the students eat as recorded in their food diary?

- Many students only had drinks for breakfast

- 可樂, 魚蛋, 燒賣, 杯麵, 薯片, deep-fried food… as snacks

- Deep-fried food and meat for lunch, go with cold drinks with high sugar

- Carbohydrates but without other food as lunch for some students

- The only meal that they had vegetables and the most balanced diet was dinner

- Fruits were rarely consumed by students
- Seldom consume high fibre food
- The meal that they had more vegetables and the more balanced diet was dinner in which they usually eat with parents
- Fruits were rarely consumed by students

<table>
<thead>
<tr>
<th>Which meals did the students get the chance of taking fibre from 4th to 6th March?</th>
<th>Breakfast</th>
<th>Snack</th>
<th>Lunch</th>
<th>Afternoon Tea</th>
<th>Dinner</th>
<th>Late Night Food</th>
<th>Excluded</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keywords</td>
<td>F.4</td>
<td>F.1</td>
<td>F.4</td>
<td>F.1</td>
<td>F.4</td>
<td>F.1</td>
<td>F.4</td>
<td>F.1</td>
</tr>
<tr>
<td>菜 (Vegetable)</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>16</td>
<td>10</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>果 (Fruit)</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>瓜 (Melon/ Squash)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>茄 (Tomato/ Eggplant)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>豆 (Bean)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>菇 (Mushroom)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>麥 (wheat)</td>
<td>7</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>椒 (pepper)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>蕉 (Banana)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>蘿蔔 (Turnip)</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>梨 (Pear)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Totals</td>
<td>12</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>32</td>
<td>28</td>
<td>10</td>
<td>0</td>
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</tbody>
</table>
What are the difficulties in achieving healthy eating among the sampled students?

<table>
<thead>
<tr>
<th>Internal factors</th>
<th>External factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor time management</td>
<td>Family influence</td>
</tr>
<tr>
<td>- reasons for skipping breakfast:</td>
<td>- not enough vegetables at home</td>
</tr>
<tr>
<td>1) Rush, no time</td>
<td>- unhealthy cooking style of parents: too much fat and oil</td>
</tr>
<tr>
<td>2) Not hungry</td>
<td></td>
</tr>
<tr>
<td>3) Wake up late on school holidays</td>
<td></td>
</tr>
<tr>
<td>Personal eating preference</td>
<td>Peer influence</td>
</tr>
<tr>
<td>- love strong taste food</td>
<td>- Forced by their classmates to eat unhealthy food during lunches and social gatherings</td>
</tr>
<tr>
<td>- unattractive food appearance</td>
<td></td>
</tr>
<tr>
<td>- healthy food tastes bad</td>
<td></td>
</tr>
<tr>
<td>Mindset as traditional consumer</td>
<td>Lack varieties and healthy choices around campus</td>
</tr>
<tr>
<td>- healthy food as expensive</td>
<td></td>
</tr>
</tbody>
</table>
What are the difficulties in achieving healthy eating among the sampled students?

- Mindset as Traditional Consumers
- Personal Eating Preference
- Family Influence
- Peer Influence

Intrapersonal Influence
- Irregular Meal Patterns
- Unhealthy & Imbalanced Diet

Interpersonal Influence
- Poor Time Management

Intrapersonal Influence

Interpersonal Influence
• The food they hate most:
  - vegetables are often mentioned

• The food they like most:
  - candies
  - potato chips
  - McDonald’s
  - ketchup
  - and more junk food…
• Tend to have a more balanced diet when eating with parents (i.e., dinner) - parents have a more significant role in breakfast and dinner

• Peers are influential in students’ food choices when not eating at home - especially lunch

• Where did they go for lunch most often?
  1. Tea restaurants in HK-style
  2. McDonald’s
  3. KFC
  4. Tam Chai Mai Sin
- All girls believed they are fat (though BMI was within normal range according to DH’s Student Health Service report)

- Perception obtained from:
  1. peers
  2. parents
  3. siblings

- Many girls skipped carbohydrates

- Picky eating
Intervention and Activities

- Health talks for students
- Health talk for parents
- Healthy cooking workshop
- Healthy eating PSA design workshop and competition
- Healthy eating PSA shooting
- Healthy eating project Facebook page
Conceptual Models

- Health Belief Model (HBM)
  - perceived barriers, cues to action, and self-efficacy

- Theory of Planned Behavior (TPB)
  - belief and attitude to influence health behavior

- Social Cognitive Theory (SCT)
  - social and physical environment
  - reinforcement and feedback from others
  - vicarious and observational learning from others
  - social and environmental cues and responses
Health Talks for Students

- Held on 12th March, 25th March, 26th June, in 2015
- By registered dietician Ms. Sharon Chan
- Goals (self-efficacy/HBM; belief and attitude/TPB; SCT):
  1. To debunk the misconceptions of students which were discovered in the preparatory phase study (e.g. Skipping breakfast, junk food…)
  2. To provide accurate nutrition knowledge and professional dietary suggestions of achieving healthy eating and personal goals
  3. To teach about reading and interpreting nutrition labels
Health Talk for Parents

- Held on 11\textsuperscript{th} July 2015
- By Dr. Ben Fong, Clinical Associate Professor(Honorary), JC School of Public Health and Primary Care, The Chinese University of Hong Kong
- Goals (belief and attitude/TPB; SCT):
  1. To inform the parents the techniques of identifying children’s problematic eating behaviour
  2. To provide suggestions to the parents regarding their children’s eating problems
Healthy cooking workshop

- Held on 11\textsuperscript{th} July 2015
- By registered dietician Ms. Sharon Chan
- Goals (perceived barriers, cues to action, self-efficacy/HBM; SCT):
  1. To empower both parents and students in pursuing a \textit{feasible} healthy eating practice
Healthy eating PSA design workshop and competition

- A PSA production workshop was held by Prof. Kara Chan on 30th June 2015 to introduce basic concepts of producing a PSA
- The participants presented their PSA ideas to the judges who are experts in the field of advertising and marketing on 6th July 2015
- Goals (HBM; TPB; SCT):
  - To inspire students to think more about the meanings of healthy eating
  - To allow students having reflexivity about their eating habit
  - To allow students applying the knowledge that they have learnt regarding healthy eating
Healthy eating PSA shooting

- The winner work is to be produced into a 30-second PSA
- To be disseminated in project Facebook, partner school’s website, and YouTube
- To be conducted on 21st November 2015
  - pre-shooting preparation and audition: 6th and 12th November 2015
- Goals (perceived barriers, cues to action/HBM; TPB; SCT):
  - To empower students in promoting healthy eating messages to others
  - To make healthy eating fun
BTHC Healthy Eating Facebook Page

- To serve as a documentary and exchange platform providing information about healthy eating, and updates and activities about the project for BTHC community (HBM; TPB; SCT)

http://www.facebook.com/bthc.healthyeat
Results and Evaluation

- Self-report food diary (Pre-post)
- Comparison of descriptive statistics
- Focus group interview
- Reflexivity for future school-based health intervention program
- Evaluation: A long road ahead
Self-report Food Diary (Pre-post)

Method
- Students were required to record:
  - the food and drinks they have consumed
  - their meal partners
  - when having breakfast, snack, lunch, afternoon tea, dinner and late night food
  - for a consecutive 3-school day period
- Same group of students were chosen
- 67 diaries were distributed, 58 were returned, 45 were valid, including 24 from S.1 and 21 from S.4 students;
- Duration: 6th-8th July 2015
- Descriptive Statistics: SPSS 20
- Content Analysis: Counting the frequency of keywords related to fibre food appeared in the food diary
Comparison of Descriptive Statistics

The comparison of descriptive statistics of having meals before and after the interventions

<table>
<thead>
<tr>
<th>Meals</th>
<th>Form 1 Phase 1</th>
<th></th>
<th></th>
<th>Form 1 Phase 2</th>
<th></th>
<th></th>
<th>Form 4 Phase 1</th>
<th></th>
<th></th>
<th>Form 4 Phase 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>M</td>
<td>SD</td>
<td>n</td>
<td>M</td>
<td>SD</td>
<td>n</td>
<td>M</td>
<td>SD</td>
<td>n</td>
<td>M</td>
</tr>
<tr>
<td>Breakfast</td>
<td>33</td>
<td>1.79</td>
<td>1.244</td>
<td>24</td>
<td>1.42</td>
<td>1.248</td>
<td>34</td>
<td>1.76</td>
<td>1.13</td>
<td>21</td>
</tr>
<tr>
<td>Snack</td>
<td>32</td>
<td>0.22</td>
<td>0.659</td>
<td>22</td>
<td>0.18</td>
<td>0.395</td>
<td>33</td>
<td>0.55</td>
<td>0.833</td>
<td>21</td>
</tr>
<tr>
<td>Lunch</td>
<td>32</td>
<td>2.84</td>
<td>0.448</td>
<td>24</td>
<td>2.79</td>
<td>0.658</td>
<td>33</td>
<td>3.00</td>
<td>0.00</td>
<td>21</td>
</tr>
<tr>
<td>Afternoon Tea</td>
<td>29</td>
<td>0.34</td>
<td>0.721</td>
<td>24</td>
<td>0.21</td>
<td>0.415</td>
<td>32</td>
<td>0.94</td>
<td>0.948</td>
<td>20</td>
</tr>
<tr>
<td>Dinner</td>
<td>33</td>
<td>2.88</td>
<td>0.331</td>
<td>24</td>
<td>2.50</td>
<td>0.780</td>
<td>34</td>
<td>2.88</td>
<td>0.327</td>
<td>21</td>
</tr>
<tr>
<td>Late Night Food</td>
<td>31</td>
<td>0.32</td>
<td>0.791</td>
<td>24</td>
<td>0.17</td>
<td>0.381</td>
<td>30</td>
<td>0.40</td>
<td>0.814</td>
<td>20</td>
</tr>
</tbody>
</table>

- The mean of every meal they had consumed in phase 2 decreased for both S.1 and S.4 students.
- The decrease in sample size in phase 2 study can contribute to the overall drop of the mean.
- There was no significant difference between the meals having in phase 1 and phase 2, except:
  - Form 1 students had significantly less dinner in Phase 2 (M=2.50, SD=0.780) than they had in Phase 1 (M=2.88, SD=0.331), t (29.074) =2.236, p=0.033<0.05.
  - Form 4 students had significantly less afternoon tea in Phase 2 (M=0.25, SD=0.550) than they had in Phase 1 (M=0.94, SD=0.948), t (49.810) =3.307, p=0.002<0.05.
Reflexivity for future school-based health intervention program

- Interactive elements are important to attract students’ attention
- Partner school’s devotion is highly important:
  - number of project Facebook’s likes
  - how much information about the project can be reached by the students?
    - can all the interested students participate?
- Implementation is often subject to the partner school’s attitudes and plan
  - who can decide who can participate
- Parents-Teachers Association has an important role
Evaluation: A long road ahead...

- Behavioural change involves a long process and is a long-term outcome influenced by attitudes and self-efficacy as well as by social norms (Ajzen, 2012)
- Students’ intentions and changing attitudes to adopt a healthier eating style were observed:
  - understand skipping breakfast as having no use in losing weight in PSA brainstorming
  - story board conveying healthy eating messages such as the importance of having breakfast and the impacts of eating junk food

→ improved knowledge level regarding healthy eating can motivate students’ implementation intention, and empower them to adopt behavioral change in eating healthily one day
Discussion (Q&A)