

Short Communication

Nutrition education for adolescents: Principals' views

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This study aimed to examine school principals' perceptions of the school environment in Hong Kong as a context for the dissemination of food knowledge and inculcation of healthy eating habits. A questionnaire survey was administered in secondary schools in Hong Kong to survey Principals' views of students' food choices, operation of the school tuck shop, and promotion of healthy eating at school. Questionnaires were disseminated to all the secondary schools offering Home Economics (300 out of 466), and 188 schools responded, making up a response rate of 63%. Collected data were analyzed using SPSS. Most of the schools (82%) claimed to have a food policy to monitor the operation of the school canteen, and about half (52%) asserted there were insufficient resources to promote healthy eating at school. Principals (88%) generally considered it not acceptable for the school tuck shop to sell junk food; however, 45% thought that banning junk food at school would not help students develop good eating habits. Only 4% of the principals believed nutrition education influenced eating habits; whereas the majority (94%) felt that even with acquisition of food knowledge, students may not be able to put theory into practice. Cooking skills were considered important but principals (92%) considered transmission of cooking skills the responsibility of the students' families. Most of the principals (94%) believed that school-family collaboration is important in promoting healthy eating. Further efforts should be made to enhance the effectiveness of school food policies and to construct healthy school environments in secondary schools.

Key Words: adolescent nutrition sciences, diet, education, curriculum, food services**INTRODUCTION**

Obesity is a global nutrition problem and is one of the major risk factors for the development of chronic diseases.¹⁻⁴ Studies have shown that the prevalence of chronic diseases partly results from poor eating habits and low participation in physical exercise.^{1,5} Changes in Hong Kong's diet in the past 20 years have led to a large increase in the prevalence of coronary heart disease and other diet related diseases,^{6,7} and the problem is becoming more common in the younger generation in recent years.⁸ Local studies revealed increasing prevalence of unhealthy eating habits and behaviors such as frequent consumption of unhealthy snacks and high energy foods, insufficient daily intake of fresh fruits and vegetables, skipping breakfast, and dieting due to weight concerns among young people.⁹⁻¹² A recent study provided evidence of these undesirable eating behavior in the age group of 11-15 years.¹³ Studies suggest that eating environments at schools should be partly responsible for the situation as the school canteens deliver a considerable proportion of a student's total daily food intake.^{14,15} Such undesirable phenomenon also suggests that the school nutrition curriculum may not be effective or sufficient to help students make healthy food choices, and is consistent worldwide.¹⁶⁻¹⁹

There are other factors which influence young people's eating behaviors. For example, the food environments provided by parents will shape children's food preferences.^{20,21} In addition, mass media messages and exposure to television food advertising,^{22,23} peers and the social eating culture are also significant factors.^{24,25} Previous investigators have suggested that accurate and appropriate

application of knowledge enables informed choices to be made,²⁶ and the principals and staff members in schools should act as role models for healthier eating and physical fitness.²⁷ Therefore the author wished to investigate the attitudes of school principals in Hong Kong and the school environment as a context to disseminate food knowledge and inculcate good eating habits.

The problem of over-nutrition has become evident in Hong Kong since early 1990. Children were not only becoming obese, but also showed signs of high cholesterol level.²⁸ Since then, the Hong Kong Department of Health has been making a continuous effort in healthy eating promotion in the school environment. For instances, initiatives such as the 'Healthy Tuckshop Movement for Primary Schools' have been implemented to promote healthy snacking habits in primary schools;²⁹ and the territory wide "EatSmart@school.hk" campaign was launched in 2006 to cultivate healthy eating practices in children.³⁰ However, these and other programs mainly targeted primary students. The situation among the more autonomous secondary students is less clear and requires investigation.

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Ackermann argued that unhealthy foods and beverages sold in school canteens may undermine the efforts of other healthy eating practices at schools.³¹ Therefore, a healthy school environment is imperative to support classroom learning.³² The notion of the 'health-promoting school' seeks to improve the health of children and adolescents using the school as a site for interventions and activities.^{32,33} The Hong Kong Healthy Schools Award Scheme implemented since 2001 by The Centre for Health Education and Health Promotion of the Chinese University of Hong Kong and the Education and Manpower Bureau of the Government has been shown to be successful in improving students' health through health intervention and education programs in participating schools. Relevant courses for teachers and individuals are offered by the centre. Yet the healthy School Award Scheme and the programmes offered by the Centre take a holistic approach to Health Education, which includes areas such as: mental and physical health, environmental hygiene, personal health skills, and other youth risk behavior such as sex and substance abuse. Unhealthy eating is just one among a variety of focuses concerning youth risk behaviors. Apart from that, in the current year, among more than a thousand (1049) primary and secondary schools in Hong Kong,³⁴ only 117 (69 primary, 36 secondary and 12 special schools) have joined the Scheme.³⁵

In Hong Kong, food and nutrition topics were usually taught in the Home Economics curriculum, or the Liberal studies curriculum. Home Economics is offered in co-educational schools and girls' schools as a core subject at junior levels, and as an elective at senior levels. Whilst a common timeslot in the school timetable is shared by Home Economics and Design and Technology at junior levels, there is limited time to cover all the contents suggested. As for Liberal studies, it is offered at advanced senior levels only and it became a core subject in the New Senior Curriculum only since 2009.³⁶ Complaint about the lack of explicit curriculum in nutrition is not specific to Hong Kong.³⁷ Whether food and nutrition topics are accessible to all students depends on how teachers value the importance of the topic as subject content, thus is often selected at the teachers' discretion.

In one study conducted in Hong Kong, 80% of a sample of secondary home economics teachers felt that despite their utmost efforts, it is difficult to develop healthy eating habits in students through the food and nutrition curriculum alone.³⁸ Teachers asserted the influences of families, peers, the social eating culture and the media; and affirmed inadequate support in terms of time and resources provided by school as one of the major difficulties encountered, for instances, limited time allotted to nutrition curriculum and the absence of policies in the management of school canteen and food provision. Teachers believed that there is a need for a greater focus on the school environment as a setting to promote healthy eating.³⁸ In this regard, it is perceived that there may be differences in the extent to which school environments support or inhibit healthy eating practices. Usually the ultimate decision for activities conducted in schools and resource allocation lies with the principals, yet some school principals might have adopted food policies whilst others have not.

Maddock *et al.*³⁹ identified positive factors associated with food policies in schools, for instances, higher levels of satisfaction with school foods; integration of the school food services and curriculum; less reliance on outsourcing of food services and more reliance on internal resources like parent and student volunteers. Provision of food policy in schools have been associated with merits such as regulating the supply of food types; controlling the sales of high fat snacks and high sugar beverages sold via vending machines; and guaranteed food safety.⁴⁰ However, there have not been any studies on the principals' views of food policies in relation to healthy eating in Hong Kong secondary schools. A questionnaire survey was conducted in 2005 to:

- investigate the secondary school environment's potential to promote healthy canteens
- foods and healthy eating practices;
- explore the principals' views of the place of food and nutrition in the school curriculum and its effect on students eating habits; and
- examine the principals' beliefs about the adoption of school food policies and health promotion initiatives.

It was hypothesized that nutrition education may not be an important priority for principals; and there may be difficulties perceived by principals in implementing an effective nutrition curriculum at school.

MATERIALS AND METHODS

Subjects and instruments

The sample included principals of all the secondary schools in Hong Kong offering Home Economics as core study at junior secondary levels (aged 11-15 years). The school list was obtained from the Field Experience Office of the Hong Kong Institute of Education. This made up a sample size of 300 principals (out of 466).

The questionnaire was based on literature, and findings from the Teachers Survey which revealed difficulties encountered in the school environment as one of the influential factors over young people's eating habits.³⁸ Thirty-one open-ended questions about the principals' perceptions and views of students' food choices and food provision practices in the school were included. It focused on the following areas:

- Demographic characteristics of the students.
- The principals' perceived control over the operation of the school canteen/ tuck shop.
- The place of food and nutrition and cooking skills in the school curriculum.
- The principals' attitudes about students' eating habits.
- The principals' attitudes towards the promotion of healthy eating at school.

The questionnaire was scrutinized to ensure construct validity. Eight academic staff members from the Hong Kong Institute of Education were invited to examine content validity. Two principals were invited to pilot-test the questionnaire to check appropriateness of response categories, the time taken to complete the questionnaire and to ensure its comprehensibility.

Procedure

The questionnaires were sent to the principals in May 2005 and a cover letter explaining the purpose of the

study and assuring confidentiality and the right of the participants. The respondents were requested to return the questionnaires within a four week period. Three hundred questionnaires were sent and 188 were returned (63%).

Data analysis

The data were analyzed using SPSS (v. 12.0). The Principals were categorised into two groups according to the presence or absence of a food provision policy at their schools. Chi-square tests were used to test for the differences between the their responses to the individual items. An alpha level of 0.01 was set to determine statistical significance.

RESULTS

Location of schools

The majority (143, 86%) of the principals sampled were from schools in subsidized and private independent schemes; 14 (8%) of them were from government schools and only ten (6%) were from aided or direct subsidy schools. The distribution of schools in the various areas was in proportion to the total number of schools located in each area in Hong Kong. This sample was representative of the range of schools in Hong Kong (Table 1).

Food and nutrition in the school curriculum

In the majority of schools (93%), food and nutrition was taught as part of the Home Economics curriculum. In about one third of these schools (37%), food and nutrition topics were also taught in Liberal Studies. In some cases (4%), these topics were dealt with through extra-curricular activities. Fifty-six percent of the respondents believed that the nutrition curriculum in their schools adequately met students' needs. Forty-eight percent thought that their students had mastered skills in healthy food choices. However, 52% thought that there were insufficient resources available in the school to help promote healthy eating. Health promotion activities were sometimes organized for students in 55% of the surveyed schools. Only a quarter of them organized these activities for parents.

Whilst the principals (92%) were in favour of children learning cooking skills, most (92%) thought it was the family's responsibility to teach them. In their responses to an open-ended question about the importance of cooking skills, most principals indicated that cooking is an important life skill that is required for independent living. Some thought that cooking skills enhance healthy food choices and help students develop healthy eating habits; others believed that cooking nurtures the sense of responsibility

in the family and minimize eating out.

Principals' perceptions of the factors which influence students' eating habits

Many principals (44%) considered the family to be an influential factor in students' eating habits. Peer and media influences were also regarded as influential by 25% and 20% respectively. Few principals (4%) believed that education is more influential over eating habits than other factors. The majority (94%) felt that even students who have acquired knowledge in food and nutrition may not practice healthy eating; and banning junk food from the school canteen would not help students to develop good eating habits. About half of them (47%) thought the school environment has little influence.

Principals' perceptions of the factors which impede school healthy eating education

The impact of media and food advertising was seen by most of the respondents (91%) as a major negative influence. Inconsistencies between school and home practices were also considered by many principals (64%) as hindering factors. Resource implications including shortage of teachers specialized in nutrition (37%) and time availability (53%) were also mentioned as perceived difficulties. Other limiting factors suggested included limited resources such as lack of suitable teaching materials; negative impacts brought about by the social eating culture; the human desire for food enjoyment; and the belief that food choice is directed by one's lifestyle and personal values. Some respondents mentioned that schools should focus on the academic and moral aspects of education rather than on the development of healthy eating habits.

Principals' attitudes regarding food sold in the school canteen

Soft drink vending machines were available in most of the schools (92%). Only 8% considered it appropriate for the school tuck shop to sell "junk" food. On the other hand, slightly more principals (45% agree 40% disagree) believed that banning junk food from the school would not help students to develop good eating habits. While most of the respondents (98%) favored distilled and mineral water as options in the schools' vending machines, soft drinks (85%), flavored drinks (90%) and sugar free drinks (93%) were also accepted by the majority. Only a minority of the respondents considered candies (21%) and chips (28%) unacceptable in vending machines.

Table 1. Location of participant schools in the sample

Location of School Type of School	Hong Kong Island		Kowloon		New Territories		Total	
n = 167†	% (count) of sample schools / Actual number of schools in HKG‡							
Government School	10 (3)	8	0 (0)	8	11 (11)	20	8 (14)	36
Subsidised/Private Independent Scheme	84 (25)	60	90 (35)	100	85 (83)	212	86 (143)	372
Aided/Direct Subsidy Scheme	6 (2)	12	10 (4)	26	4 (4)	20	6 (10)	58
Total	100 (30)	80	100 (39)	134	100 (98)	252	100(167)	466

†The total number of completed questionnaires is 188. This is the minimum number with the missing counts deducted.

‡Source: <http://hkcdcity.net> 34

Table 2. Examples of lunch guidelines used by schools

Examples (n=188)	Count
Food provided for lunch must be nutritious; balanced diet; lunch box should contain more vegetable and less meat, more fibre, fruit should be provided	42
Principal, Teachers, parents and students should be able to evaluate, contribute opinions and make decision on lunch box issues	38
Use of seasonings should be minimized; no food additive should be added; use less oil; avoid deep frying method of cooking	17
Monitor quality and quantity of lunch box; supervise lunch box caterers quality; school should involve in decision of menu	12
Reasonable cost; options provided for students	8
Beware of food hygiene; avoid high risk food such as sushi	5
Lower form students required to take lunch at school (eating out not allowed)	5
Avoid unhealthy ingredients and items such as sausages, ham, instant noodles and soft drinks	3

Table 3. Comparison of Principals' beliefs between schools with and without a food policy

Items	n=152† With Policy‡	n=33† With no Policy	n=185† All	chi-square and p-value
Perception on Adequacy of students' food knowledge	% agree (% disagree)			
The nutrition curriculum in my school adequately meets students' needs	57 (43)	52 (49)	56(44)	.361 NS
My students master skills in healthy food choices	48 (52)	52 (49)	48 (52)	.157 NS
Even students have acquired knowledge in food and nutrition, they may not be able to practice healthy eating	94 (6)	94 (6)	94 (6)	.395 NS
Attitude on factors influential to students' eating habits				
School has little influence on students' eating habits	50 (50)	33 (67)	47 (53)	2.91 NS
It is difficult to develop students' healthy eating habit through the school curriculum.	36 (64)	33 (67)	36 (64)	.112 NS
Banning junk food from the school canteen / tuck shop would not help students to develop good eating habits	45 (55)	46 (54)	45(55)	.509 NS
School-Family collaboration is important in promoting healthy eating	94 (6)	91 (9)	94 (6)	.463 NS
Perception on cooking skill				
Cooking skill is important life skill.	93 (7)	88 (12)	92 (8)	.890 NS
Young people do not need to learn how to cook nowadays	6 (94)	3 (97)	5(95)	.434 NS
It is the family's responsibility to transmit cooking skills to the next generation	91 (9)	97 (3)	92 (8)	1.37 NS
Perception on selling of junk food at school canteen				
I think it is okay for the tuck shop to sell junk food such as soft drinks and chips	94 (6)	91 (9)	94 (6)	.463 NS
Potato chips are tolerable in vending machines in my school	% tolerable (% unacceptable)			
	74(26)	63 (37)	72 (29)	1.57 NS
Soft drink vending machines are available in my school	% yes (% no)			
	91 (9)	97 (3)	92 (8)	1.37 NS
School involvement regarding lunch provision				
My school has devised policies concerning lunch issues of students.	59 (41)	50 (50)	58 (42)	.885 NS
My school negotiates with lunch box caterers about the options provided to students	95 (5)	87 (13)	94 (6)	3.01 NS
Initiatives in promoting healthy eating at school	% Always or Sometimes (% Rarely or Never)			
Healthy eating activities are organized for students in my school.	63 (37)	67 (33)	64 (36)	.126 NS
Relevant health promotion activities are organized for parents in my school.	31 (69)	15 (85)	28 (72)	3.27 NS

†These are the minimum numbers with the missing counts deducted

‡With a policy = school with a food policy; With no policy = schools without a food policy

NS= not significant

Principals' control over the operation of the school canteen and provision of lunches to students

Canteen Committees had been set up in most of the schools (82%) in the sample to monitor the operation of the school canteen or tuck shop. These committees were comprised of teachers, parents, students, and canteen managers. In a quarter of the schools, the principal was also a member of the committee. In two thirds of the schools (66%), the students' lunches were mostly pro-

vided by lunch box caterers. Some students ate out (20%) but eight percent bought their lunch from the school canteen or brought from home (4%). More than half of the schools (58%) in the sample had devised lunch policies to monitor relevant lunch issues in the school. Yet the majority of the schools (93%) were involved in selection of lunch options from the menus provided by the lunch box supplier. (Table 2)

Comparison of Principals' beliefs between schools with and without a food policy

Regarding attitudes towards healthy eating practices at schools, no significant differences were observed between the principals from schools with a food policy and those without a food policy (Table 3).

DISCUSSION

Whilst half of the principals surveyed believed that the nutrition curriculum in their school adequately met students' needs and that their students could master the skills required to make healthy food choices; as many also asserted there were insufficient resources to implement school-based nutrition and healthy eating programmes. Insufficient time and lack of teachers specialized in food and nutrition were among the difficulties mentioned. However, in practice the allocation of resources is often balanced between different areas within the school curriculum. Whether healthy eating programs could be allotted adequate time and resources depends on how the principal values the importance of nutrition education. Their decisions may also be influenced by parents' preferences. Chinese parents generally expect their children to excel in academic subjects. This has partly brought about a school curriculum which is extremely academically oriented.⁴¹

Lee has argued that student health programs are not accorded a very high priority in Hong Kong schools. Health-related topics are not recognized as 'academic' subjects, and so may be considered to be less important than academic subjects. Hence, in a congested time table they tend to be given less time.⁴² Principals may have to use resources more creatively in order to strike a balance between the 'academic' and 'life skills' areas in the curriculum. Overseas studies argued that a general population-based approach with regard to managing and controlling obesity was considered more feasible and economical,⁴³ yet addressing the issue at an earlier stage through nutrition education, when children and young people are forming lifestyle habits may be less expensive and more effective.⁴⁴ The government may need to allocate more resources to health subjects and relevant activities, if long-lasting healthy eating habits are to be developed in the young generation.

Previous studies suggest that cooking skills do not occupy a pre-eminent place in modern health promotion practice; and are often marginalized in the school curriculum,^{45,46} despite the recognition that lack of familiarity with food and lack of food preparation skills are among the barriers to the consumption of a healthy diet.⁴⁷ In this regard, findings from this study were consistent with those from previous studies. The majority of principals in this study asserted cooking as an important life skill that is required for quality and independent living for both boys and girls, yet as a component of the Food and Nutrition curriculum, cooking has been allocated less time in the Hong Kong school curriculum in recent years.⁴⁸ Although this study revealed principals' positive attitudes about cooking skills, most of them believed that transmission of cooking skills should be the responsibility of the students' families. A local study on perceptions of cooking skills suggested that school should be an important setting for the acquisition of cooking skills as young peo-

ple in Hong Kong either rarely or never had any opportunity to cook with their parents, though many of them cited parents as a major source of learning cooking skills.⁴⁹ While current studies indicate that school cooking and eating programs play a significant role in the development of healthful food choices,⁴⁶⁻⁵⁰ it is important that school principals in Hong Kong be informed of this and provide students with adequate opportunities in the school curriculum to learn cooking skills.

In accord with the views and findings from literature, the principals in this sample reported that their schools have to battle against the strong impact of media and food marketing as well as the social eating culture.

Since they regarded media influences as important, it would be logical for them to promote the consumer education elements in the school curriculum to ensure that students are equipped with strategies to cope with food marketing.

The principals indicated that inconsistent approaches at school and at home, and insufficient school-home communication were barriers to healthy eating promotion. However, only one in four of the surveyed schools sometimes organized healthy eating promotion activities for parents, reasons being that schools generally find it difficult and time-consuming to actively engage parents. In his effort to initiate Health Promotion Schools in Hong Kong, Lee suggested that Parent Teacher Associations are an effective channel for supporting school-based health promotion.⁴² Such practices are more common in primary schools in Hong Kong, where parents are often keen to participate and the children are more in their control of daily routines. However, this is not as easy with the more independent and autonomous secondary students, so continuous efforts should be made to establish home school collaboration, in particular at secondary schools. As indicated by the principals, peer support may also be an effective way to promote healthy eating initiatives among secondary students. This is another area which warrants further investigation.

This study showed no significant differences between those schools with or without food policies (Table 3). This suggests that principals in schools with food policies might not hold more positive attitudes towards healthy eating than those in schools without policies. Indeed principals appeared to believe that the school environment and education have little influence on students' eating habits. Many of them thought that banning junk food from the school canteen would not help students to develop good eating habits. This may explain why soft drink vending machines were available in ninety percent of the schools surveyed. Overall the findings suggest that many of the principals were rather apathetic regarding the role of the school as a good model in healthy eating. More advocacy and education among principals about the importance of healthy eating promotion may be needed. They should be encouraged to put more efforts into the implementation of effective food provision policies.

Implications for school health

Principals' apathetic attitude revealed a low awareness of the essential role played by school food and nutrition programs in the development of healthy food habits. In-

creased resources and funding support from the Government may encourage the principals to allocate more time and resources to food literacy programs at secondary schools through diverse subject areas and extra-curricular activities. While principals asserted cooking as an important life skill that is required for quality and independent living, they should value hands-on experiences of cooking as an important area in the food curriculum. Principals could also explore means to collaborate with parents, with a view to help students put food theory acquired from school into everyday practice. Since school food policies appeared to be ineffective, the government should also consider mandating policies to enhance healthy eating environments in schools. To help young people develop life long healthy eating habits, further research should examine the influence of other factors influencing secondary school students' food choice, for example, peers, the mass media, and food marketing.

Limitations

The sample for this study included only principals of the secondary schools in Hong Kong offering Home Economics as core study at junior secondary levels. The schools not offering Home Economics (such as boys' schools) may have provided nutrition programs through other means. Therefore results may not be generalized to the secondary school population in Hong Kong at large.

CONCLUSION

Development of healthy school environments through the establishment of effective food policies and a sound food literacy program incorporating hands-on approaches to application of nutrition knowledge may be an effective way to help students develop life-long healthy eating habits. Nevertheless, to enhance successful implementation of school food and nutrition programs in secondary schools, secondary school principals' faith in the importance of nutrition education and a healthy school environment is imperative. They should not accept the status quo and inadvertently undermine the schools' role in the promotion of healthy eating.

AUTHOR DISCLOSURES

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Short Communication

Nutrition education for adolescents: Principals' views

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校長對青少年營養教育的看法

本研究旨在探討香港的中學校長們對於在校內灌輸食物營養知識及培養健康飲食習慣的看法。此項在香港進行的問卷調查，收集了中學校長對學生的食物選擇，學校小食部的管理，以及在學校促進健康飲食的意見。問卷分發到所有提供家政科的中學(466 所中學的其中 300 所)，共有 188 位校長回覆，回應率為 63%，並採用 SPSS 統計軟件將所收集的數據進行分析。調查結果顯示大部分的受訪校長(82%)聲稱有政策監察學校食堂供應食物的運作；而大約一半(52%)則表示沒有足夠的資源在學校推廣健康飲食。校長(88%)一般認為不可接受小食部出售垃圾食物，却有 45%的受訪校長認為禁止在學校售賣垃圾食物對養成學生良好的飲食習慣並無幫助。只有 4%的受訪校長認為營養教育能影響飲食習慣，而大多數(94%)則認為即使學生對食物及營養有認識，亦未必能夠把理論付諸實踐。雖然受訪校長一般認同烹調技能的重要性，但大多數(92%)認為教授學生烹調技能是家庭的責任。受訪校長(94%)幾乎一致認為家庭及學校的合作對促進健康飲食極為重要。相關工作者仍需進一步的努力，以加強學校食物監察政策的有效性，為學校建構健康的飲食環境。

關鍵詞：青少年營養學、飲食、教育、課程、膳食服務