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Title: Online Canteens: Awareness, use, barriers to use, and the acceptability of potential online strategies to improve public health nutrition in primary schools.

Running Head: Online canteens: Awareness, use, barriers and acceptability

Abstract

Issue addressed: This study assessed the awareness, use, barriers and acceptability of online canteens in primary schools.

Methods: A telephone survey of 123 primary school principals within the Hunter New England Region of New South Wales, Australia was conducted from September 2014 to November 2014.

Results: Fifty-six percent of principals were aware of the existence of online canteens, with 8% having implemented such a system, and 38% likely to do so in the future. Medium/large schools were more likely to be aware of, or to use online canteens, however there were no differences in awareness or use in terms of school rurality or socioeconomic advantage. Principals cited parent internet access as the most commonly identified perceived barrier to online canteen use, and the majority of principals (71-93%) agreed that it would be acceptable to implement a range of consumer behaviour strategies via an online canteen.

Conclusions: Study findings suggest that despite relatively low levels of current use, online canteens have the potential to reach a large proportion of school communities in the future, across geographical and socioeconomic divides, and that the nutrition interventions which they have the capacity to deliver are considered acceptable.

So what? As such, online canteens may represent an opportunity to deliver nutrition interventions to school communities. Future research should examine the feasibility and potential effectiveness of interventions delivered via this modality.

Short Abstract

This telephone survey of 123 primary school principals suggests that online canteens have the potential to reach a large proportion of school communities across geographical and socioeconomic divides, and that the nutrition interventions which they have the capacity to deliver are considered acceptable.

Introduction:

Dietary risk factors are the leading cause of disease burden in Australasia¹. Schools, and in particular school canteens, represent an opportune setting for implementing healthy eating initiatives to improve public health nutrition, as they provide access to large numbers of children at a critical time in their development². Australian government school canteen policies have focused on increasing the availability of healthy foods, and restricting the availability of unhealthy foods, as a means of improving the nutritional quality of school canteen purchases³. Although some progress has been made in reducing the availability of unhealthy canteen items⁴, rates of compliance with such supply-focused policies vary greatly and are generally low^{5, 6}. While food availability influences food purchasing⁷, other consumer behaviour interventions such as nutrition labelling and feedback, purchasing prompts and incentives have also been found to encourage healthy food selection from school cafeterias and fast food menus by and for children⁸⁻¹¹. Inclusion of such strategies in the marketing of school canteen products may provide a means of increasing the impact of healthy canteen interventions on child nutrition.

Online canteen ordering systems (henceforth ‘online canteens’), where parents or students order and pay for their lunch orders online, are increasingly popular. Online interactive systems represent an attractive opportunity to deliver consumer behaviour interventions to a large number of users, in real-time, and at a relatively low cost¹², and as demonstrated by an recent ACT initiative¹³, they also have the capability to deliver strategies such as traffic light nutritional labelling. However, no published Australian study has investigated the potential of online canteens to deliver nutrition interventions. This study aimed to 1) assess awareness, use and likely use of online canteens among primary school principals within the Hunter New England (HNE) region of New South Wales (NSW), 2) explore whether these factors differ by school characteristics (sector, size, rurality, disadvantage), 3) identify perceived barriers to

using online canteens, and 4) assess acceptability of consumer behaviour strategies that could be implemented through an online canteen to improve child public health nutrition.

Method:

Study Design and Setting:

A cross-sectional survey of primary school principals from the HNE region of NSW.

Sample and recruitment:

All 417 non-special-purpose primary schools in the study region were invited to participate in a school environment survey, 344 of which provided consent (82%). Of these, 70 were currently participating in a randomised trial conducted by the study team, a further 67 did not have an operational canteen, and 98 had already completed or been approached to complete the school environment survey prior to September 2014. All 123 principals who were invited to participate in the school environment survey between September and November 2014 received a survey module regarding online canteens, which is the subject of this study. The online canteen survey module was conducted from September 2014 and November 2014 and all study procedures were approved by the HNE Human Research Ethics Committee (H-2008-0343).

Data collection and measures:

School Characteristics: Principals were asked to provide the number of student enrolments, with schools subsequently classified as “small” (≤ 159 enrolments) or “medium/large” (160+ enrolments). Information regarding school sector (Government/Non-Government) and school postcode was obtained from school websites. Postcode was used to classify the

location of the school as ‘urban’ or ‘rural’¹⁴, and as ‘higher’ or ‘lower’ socioeconomic status¹⁵. Principals were asked to report if the school had wireless internet access.

Awareness, use and future use of online canteens. Principals were asked if they had heard of, previously used, or would use online canteens in the future (Yes; No; Don’t Know). Those that had not previously implemented an online canteen were asked how likely they were to implement such a system at their school, and the likelihood of implementation in the context of technical support, staff training and system promotion being provided (which is typically offered by online canteen providers to support system set-up) (Very likely; Likely; Unsure; Unlikely; Very unlikely). Principals that had previously implemented an online canteen were asked a series of questions about whether they agreed (using a 5-point Likert Scale - strongly agree to strongly disagree) that the system was acceptable to themselves, staff and parents, and whether it made the job of the canteen manager easier.

Perceived barriers to implementation of online canteens: Principals that had not previously implemented an online canteen were asked to identify the main perceived barriers to doing so (from a list of 11 potential barriers). An open-ended response option was also provided.

Acceptability of consumer behaviour strategies: Principals were read a list of consumer behaviour strategies to encourage healthy purchasing that could be incorporated into online canteens. These strategies have been shown to influence food selection and consumption behaviours in other settings^{10,11,16}. For each strategy, the principal was asked to rate on a 5 point Likert scale (strongly agree to strongly disagree) the degree to which they agreed each was acceptable.

Analysis:

Data analysis was conducted using SAS 9.3¹⁷. To determine associations between school characteristics and online canteen; awareness, use, and future use, chi-squared analyses (or Fishers' Exact tests where expected cell count was <5) were conducted (alpha=0.05).

Results:

School characteristics: Table 1 describes school characteristics of the 123 schools that completed the online canteens survey module.

Awareness, use and future use of online canteens: Of the 123 surveyed, 56% (n=68) were aware of the availability of online canteens, and 8% (n=10) had ever implemented such a system (with two Principals no longer using an online canteen). Between 70-90% (n=7-9) of principals that had ever implemented an online canteen agreed or strongly agreed that the system was acceptable to themselves, to staff and to parents, and 70% (n=7) agreed or strongly agreed that it made the job of the canteen manager easier. Among those who had not implemented such a system, 16% (n=18/112) reported being likely to implement one in their school, and 38% (n=42/112) reported being likely to implement one provided they received free technical and implementation support and training. Compared to small schools, medium/large schools were more likely to be aware of, or to have used online canteens, or be more likely to use in the future, however there were no differences in access or use in terms of school rurality or disadvantage (Table 2).

Perceived barriers: The top five perceived barriers to implementing online canteens were: parent internet access (n=71/112, 63%), set up time (n=52/112, 52%), canteen internet access (n=46/112, 41%), difficulty of use for parents (n=44/112, 39%) and for the canteen manager (n=39/112, 35%).

Acceptability of consumer behaviour strategies: The large majority of principals agreed that the proposed consumed behaviour strategies were acceptable (Table 2).

Discussion:

This is the first study to examine the use of online canteens in Australian primary schools. The findings suggest that almost all schools have internet access that would facilitate use of an online canteen. Only 8% (n=10/123) of schools had previously implemented an online canteen, however, the growth potential of online canteens is considerable given almost 40% (n=42/112) indicated they would be willing to implement an online canteen provided sufficient support was available.

Encouragingly, there were no significant associations between the awareness, use or intention to use online canteens according to geographic or socioeconomic characteristics of the locality of the school, suggesting that nutrition interventions that utilise online canteens would provide access to rural, and socio-economically disadvantaged children and their families. Principals of medium/large schools, however, were more likely to have heard of online canteens, have ever used them, or be planning to use them in the future. Such findings may reflect the reduced operational demands of canteens in smaller schools, and therefore, the perceived limited additional advantages from online canteen management.

The study provides strong support for the potential integration of consumer behaviour strategies into online canteens as a public health initiative. Between 71-93% (n=83/117, n=110/118) of principals considered the consumer behaviour strategies that could be implemented through online canteens to be acceptable, particularly those that involved the provision of nutritional information and labelling. These findings are similar to a U.S. study of emerging restaurant technologies, which reported that consumers rated tableside 'virtual

menus' that provided nutritional information the most valuable from a list of 11 potential technologies¹⁸. Given the impact of such strategies in improving public health nutrition in other settings such as cafeterias^{10,16}, their integration into online canteens has considerable public health potential. Study limitations include the low sample size of the subgroups investigated (e.g. Non-Government schools), and it is unclear how these results would generalise to schools in more remote or advantaged areas, or schools in different states, and future research should investigate. Furthermore, research is also needed to substantiate the broader benefits to school communities claimed by online canteen providers including a reduced reliance on canteen volunteers and increased canteen revenue¹⁹.

Conclusion:

Despite relatively low use, most schools were aware of online canteens and 38% (n=42/112) were likely to use such systems if adequate support was provided. Principals cited parent Internet access as the primary barrier to implementing online canteens, which may need to be addressed in order to increase adoption, particularly among small schools where measures of awareness, use and likely future use were lowest. Nonetheless, principals rated a range of consumer behaviour strategies that could be embedded in online canteen systems as highly acceptable, suggesting considerable potential of online canteens to support healthy eating in this setting.

Table 1: School Characteristics

	n (%) N=123
School Sector	
Government	110 (89%)
Non-Government	13 (11%)
School Size	
Small (1-159 enrolments)	61 (50%)
Medium/Large (160+ enrolments)	62 (50%)
Rurality	
Urban (Major Cities/Inner Regional)	82 (67%)
Rural (Outer Regional/Remote)	41 (33%)
Disadvantage	
Higher SES (top 50% of NSW)	22 (18%)
Lower SES (bottom) 50% of NSW	101 (82%)
School Internet access	
Wireless	116 (94%)
Not wireless	6 (5%)
Don't Know	1 (<1%)

Table 2: Awareness and use of online canteens by school characteristics & acceptability of consumer behaviour strategies implemented through online canteens

	School Sector			School Size			Rurality (ARIA)			Disadvantage (SEIFA)		
	Govt	Non-Govt	p-value	Small (1-159;	Med / large (160+)	p-value	Urban	Rural	p-value	Lower SES	Higher SES	p-value
<i>Awareness:</i> Aware of online canteens (N=122) ¹	61 (56%)	7 (58%)	0.88	25 (42%)	43 (69%)	0.00	46 (56%)	22 (55%)	0.91	56 (56%)	12 (55%)	0.90
<i>Use:</i> Ever used online canteens (N=68) ²	9 (15%)	1 (14%)	1.00 [#]	0 (0%)	10 (23%)	0.01 [#]	9 (20%)	1 (5%)	0.15 [#]	9 (16%)	1 (8%)	0.68 [#]
<i>Future use:</i> Likelihood of use –with support (N=112) ^{1,3}	34 (34%)	8 (67%)	0.05 [#]	17 (28%)	25 (48%)	0.03	24 (33%)	18 (46%)	0.17	36 (40%)	6 (29%)	0.35
Consumer Behaviour Strategy											% Agreed⁴ (95%CI) N=117-119⁵	
<i>“It would be acceptable to”</i>												
Display nutritional information about each online menu item e.g. sugar, fat or salt content.											93% (89-98%)	
Label online menu items as 'Green' or 'Amber' according to Fresh Tastes @ School ⁶											92% (88-97%)	
Provide parents with online suggestions for how to make their child's lunch order healthier											89% (83-95%)	
Provide parents with alternative suggestions to make their child's lunch healthier based on fat, sugar and/or salt content											84% (77-91%)	
Provide students with an online certificate, if within a term, the majority of their lunch order items were 'green'.											77% (70-85%)	
Provide parents with an online summary of their child's lunch orders each term, comparing current orders to order from previous terms.											71% (63-79%)	

¹ 1 principal refused to provide an answer

² Sample restricted to those aware of online canteens (N=68)

³ Sample restricted to those not previously used online canteens (N=112)

⁴ Responses represent ‘strongly agree’ and ‘agree’ combined

⁵ Excludes 3-5 principals who rated the questions as ‘not applicable’ and 1 principal who refused to answer

⁶ Fresh Tastes @ School is the NSW Healthy School Canteen Strategy

[#] Used Fishers’ Exact test

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