PACIFIC HEALTH DIALOG
MARCH 2014 · VOLUME 20 · NUMBER 1

STUDY

Kelston Beverages Pilot Study: Rationale, Design and implementation of a community and school based intervention to reduce sugary drink consumption among children and youth.

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ABSTRACT

The Kelston Beverages Study was designed to increase awareness of the sugar content of sugary drinks, the poor health consequences that high intake of these drinks have, and inform on ways to reduce intake of students. The aims of this pilot study were to refine interventions and processes designed to raise awareness of the harms that sugar sweetened beverages (SSBs) have on health, and to reduce their consumption among the youth of a small West Auckland suburb. There were three arms to this interventional study, one in schools, another in community organisations (churches, sports clubs and community groups), and the final arm is in the local retail sector. The school arm was the most extensive component and initially involved a survey of children's knowledge and consumption of sugar sweetened beverages (SSBs) using a brief questionnaire. The study evaluated any SSB policies in schools and for schools that did not have policies, opportunities were scoped to develop and implement them; a canteen AUDIT focussed particularly on beverages was carried out; and finally a student partnered social marketing exercise was undertaken that comprised 2 competitions, one to design a poster, and another to write and perform a rap. Children were re-surveyed at the completion of the intervention (7 months later) to determine change in knowledge and self-reported consumption of SSBs. Both the community organisations and retail arms of this study focussed on raising awareness into the harmful effects of SSBs and establishing healthy beverage policy in the respective organisations. Promising results with regards to acceptability, feasibility, and recruitment as well as valuable learnings with regard to process support the development of a proposal to conduct a cluster randomised trial of the interventions successfully tested in this pilot study.

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Introduction

The harm that sugar-sweetened beverages (SSBs) or sugary drinks have on health is well established.[1-19] In the absence of strong local body or national policy/regulation designed to limit consumption, there is a need to develop and trial solution focussed interventions to reduce the intake of sugary drinks, particularly in children. Internationally many studies have addressed this successfully.[20-22] These studies have used varied approaches to bring about a reduction in the consumption of sugary drinks. Interventions have included reducing the availability of SSBs in school canteens, and school vending machines,[20] as well as providing 'in-school' educational programmes for students to discourage children from drinking soft drinks.[21-23] Results from these studies have demonstrated a significant reduction in consumption of SSBs as well as body mass index (BMI) levels.[24]

In New Zealand, the 'Beverage Guidelines Project' led by a local district health board was trialled in a number of West Auckland schools in 2005.[25] Guidelines were developed that encouraged schools to stock healthier drinks, particularly in their canteens. In one school the outcome saw more than 125kg of sugar being removed from consumption per week.[25] Unfortunately, this programme has ceased to exist and was not formally evaluated.

This article describes the rationale, background and methods employed in the Kelston Beverages Study, which aimed to raise youth awareness of the harmful effects of sugary drinks as well as reduce their consumption within the intervention community.

Background: To gauge interest of local schools within the designated pilot intervention community, a presentation of the research proposal was made to a network of the local school principals. This consisted of all 6 school principals from the suburb, and took place on June 18th, 2012. From this presentation 5 principals indicated their support and willingness to be part of this study. These schools included: 1 high school (age 13-17 years), 1 intermediate school (age 11-12 years) and 3 primary schools (age 5-10 years).

Aim: The current pilot study was designed to trial a multi-component community partnered intervention of quasi experimental design, to i) raise awareness of the sugar content of SSBs, ii) raise awareness into the harmful effects that sugary drinks have on health, iii) promote strategies to reduce intake of SSBs, and finally iv) to reduce the overall intake of SSBs at a community level and particularly in youth.

Research design and methods: While this research project encompassed 3 settings as illustrated in figure 1, the major focus was on schools. The three intervention settings were schools, community organisations and the retail sector. The initial goal of the community organisation and retail sector initiatives was to increase community awareness of the school initiatives and to encourage the community to support it.

1. School based initiative: children and youth aged from 5 – 18 years

The School based initiative encompassed three separate yet related components which were i) a survey (conducted at baseline and again at follow-up), ii) a social marketing campaign, iii) the development of a healthy beverage policy. For inclusion into this study, schools were required to participate in a minimum of two components (i and ii). Although the social marketing mobilised the most activity amongst students, the development of a healthy beverage policy was the only long-term sustainable outcome.

Table 1 Healthy Beverages in Kelston, a community partnered initiative.

Healthy Beverages in Kelston		
School based	Community organisations	Retail sector
Primary Intermediate Secondary	Churches Sports clubs Other organisations	Local shops Local mall

Component One: Survey

This was designed to determine:

i. children's consumption patterns (where, how much) of SSBs
ii. knowledge of sugar content of SSBs (types, brands and volumes/sizes)
iii. understanding of the health consequences of moderate consumption of SSBs

The survey developed and used in this study was modelled (in length, form, and delivery) on the Action on Smoking for Health (ASH) year 10 Survey that assesses smoking behaviours in year 10 students in New Zealand.[26] The survey consisted of 21 questions (1 double-sided A4) and took approximately 10-15 minutes to administer. Two versions were developed, one for younger children (years 5 and 6) and another for older children (years 7-10). Questions used were taken and modified from existing questionnaires and have been previously validated.[27,28] The final questionnaire was pre-tested with age-matched children to determine its usability (clarity) and the time needed to administer. There was a specific intension to minimise the time needed to complete the questionnaire to lessen the burden on both students and teachers. Questionnaires were self-completed, under the guidance of study interviewers. Children were able to ask for assistance at any time - and for younger children (aged 9-10) interviewers read aloud questions and possible responses one at a time and all students responded at the same time.

BASELINE Assessment - this was administered prior to starting the intervention to determine baseline consumption, awareness of sugar content and understandings of health implications related to SSBs.

FINAL Assessment - this took place at the conclusion of the intervention (social marketing competitions) approximately 7 months after the baseline.

Surveys were conducted in schools during assembly or at the beginning of class depending on the preference of each individual school. This meant that on some occasions our team of 7 interviewers split up and went to a number of classes to administer the surveys under the guidance of each class teacher, or we surveyed a large group of students (up to 100) in their respective school hall.

Component Two: Schools Beverage Policy

To determine whether schools had a pre-existing policy that impacted on beverage availability, each school principal (or nominee) completed a School Environmental AUDIT. The

AUDIT tool was developed using pre-existing questionnaires and consisted of 11 questions that took approximately 10 minutes to administer.[29] The AUDIT tool determined the availability of various types of beverages in the school, whether the school canteen was contracted to a commercial operator or not, and whether there were any policies that determined the type of beverages permitted in the school, and also the number of water fountains on school grounds.

For schools that already had a policy that addressed sugar-sweetened beverage, a copy of the policy, as well as a description of the background that preceded its development was requested. For schools that did not have any policy, the study team then facilitated a collaborative process to develop and draft an acceptable 'beverage policy' that could then be taken to each schools respective Board of Trustees to be ratified.

Component Three: Social - Marketing (student competitions)

A number of social marketing campaigns have already been used to address SSBs consumption internationally. In New Zealand there have been only a few examples of these.[30] In this study youth were asked to design and develop campaign messages which provided learning opportunities for them around the issue. Two social-marketing exercises were conducted with Kelston youth through the staging of two competitions (poster, RAP/Poem), these are described below.

To encourage greater uptake of these competitions and maximise the effect of the interventions, iconic New Zealand musician Che Fu (and his team) was recruited to help design and administer these competitions in collaboration with the research team.

Poster Competition

The first competition encouraged students to develop a poster that advocated for the consumption of healthy beverages, and the avoidance of unhealthy sugary drinks. Students needed to develop and refine their ideas into a poster form. As part of this poster they were encouraged to create a novel slogan/jingle to coin the message. The competition winner received a collection of prizes (toy voucher of $200, t-shirt, and ipod) and had the possibility of their design being re-worked by a graphic designer to then be displayed on promotional materials for the study and on various sites around Kelston.

Rap/Poem Competition

Students were asked to prepare lyrics for one verse to a RAP/Poem that advocates for the consumption of healthy beverages, and informs of the high sugar content in SSBs, raises awareness into the harm high intake of SSBs can have and provide solutions to reduce consumption. Two winners were selected each contributing 1 verse. The pre-recorded instrumental for the track was uploaded onto the study facebook page for participants to access, and was available from the school administration. In addition to prizes (7" tablet, t-shirt, ipod), winners had the unique experience of spending the day with Che Fu recording their RAP/Song in a professional studio. The highlight of this competition was performing their Rap, on stage with Che Fu and invited guests at a lunchtime concert at their school. The concert provided another opportunity for key messages of the study to be reiterated in regard to SSBs.

Implementation

The two competitions described above were promoted to students in participating schools over 2 'school visits' by Che Fu and Dr FiZZ. Dr FiZZ was the expert in the area of Health and the Harmful effects that SSB can have. The idea to characterise Dr FiZZ (knowledgeable expert on the topic) was created to make the messages more believable to students and allow for a clear educational dialogue to be scripted between Che Fu and Dr FiZZ.

'Visit 1' was designed to create excitement about the competitions to maximise buy-in from students to participate, whilst at the same time clearly convey the key messages about the harms SSBs have on health, and offer realistic solutions for students to reduce their consumption. All schools provided a 15 minute segment within their usual school assembly where 'Visit 1' was delivered.

As part of the visit a large amount of resource was invested into developing visual displays (a large 6m x 2m banner that covered most of the school stage, as well as smaller pop-up banners that were situated at the entrances to the school hall), a full colour pamphlet with all information related to the study and competitions, professional stage lighting was used to illuminate the area, a full professional audio system set-up, and a power point presentation with key information and the study logo was also prepared. Added to this, to accompany Che Fu on stage Dr FiZZ was stylised with the FIZZ logo embroidered onto a white lab coat. In sum the above resources and the process of this campaign were developed to provide a unique experience that would capture student's attention from the start.

The script: after a brief initial introduction by the study manager Che Fu greeted the students and gave a personal account of his life experiences that were relevant to SSBs and his health. Having consumed a large amount of SBBs as a young man, he explained his disbelief of being told (whilst still in his twenties) that he had developed Type 2 Diabetes. He then invited Dr FiZZ onto the stage to help explain the harmful effects of sugary drinks. Over a brief question and answer dialogue key messages were explained.

Following this, the two competitions were described (more detail 'Competition 1') and students invited to participate. To conclude Che then performed a song. Pamphlets that summarised the key messages and also had details of the competition were distributed to students as they exited the hall or were distributed by teachers in class.

'Visit 2' the second visit took place after the winners of the 1st Competition were determined. Winners of competition 1 (poster competition) were presented with their prizes as part of this visit. Again, 'visit 2' was conducted as part the school assembly, however, was very brief lasting approximately 5 minutes in total. The main purpose of 'visit 2' was to repeat and re-enforce the key messages around SSBs and health, and to invite students to participate in the 2nd competition (RAP/Poem). To increase children's interest in this engagement, students were asked a series of questions related to the previous visit and the educational resource. Those students that answered correctly were given a prize that was a FIZZ branded ipod.

Curriculum

Initially it was envisaged that there could be an opportunity to develop a learning module specifically on SSBs or that SSBs

could be used as an example for use in subject areas - other than health. However, after speaking to colleagues who develop educational learning modules for high schools (Jacqui Bay, Director, LENScience, LensScience, Liggins Institute, University of Auckland) and learning the resources, workload, expertise and time needed to generate a comprehensive module of this nature, we quickly learned that this was unrealistic and it was abandoned.

Outcome measures

Key outcome measures identified for this project were:

a) Existence of a SSBs policy in each participant school,
b) The level to which a SSBs policy is adhered to within the school setting,
c) Change in student knowledge on issues related to SSBs (comparison of pre and post intervention),
d) Change in consumption of SSBs by students (comparison of pre and post intervention),
e) Presence of social marketing campaigns in the school environment.

2. Community organisation based initiative:

A number of community organisations were approached to participate in this arm of the study. These included Churches, Sports Clubs and other Community Centres. The primary aim was that these organisations adopt a 'Healthy Beverage Policy' to guide the provision, sale and consumption of SSBs on their premises.

Churches

Every church in the area was contacted by the study manager who briefly explained the study and asked if a meeting could be arranged to then describe the study in more detail and formally invite them to participate.

For those churches that agreed to meet, most had to then take the request for participation to their church committee to determine their answer. For those Churches that agreed to participate a time was scheduled for a presentation to be made by the study team to the congregation outlining the harms of SSBs and potential solutions. Following this presentation, the study manager worked with the pastor or a nominee to develop and implement a beverage policy.

Sports Clubs & Community Organisations

As with Churches, local sports clubs and community organisations were also approached and a similar process was followed.

3. Retail sector initiatives:

The local retail sector was engaged with to work towards an acceptable type of initiative that would align with this projects purpose. Efforts were made to engage with all retailers within the same locality as a group (or groups of retailers) so none would feel that others may gain competitive advantage. The local Mall and three local shop settings comprised the retail sector that was approached to participate in this study. These represent all outlet/retail centres in the community.

Mall

Within the Mall complex are a number of fast-food outlets. In particular the McDonalds fastfood restaurant was approached to determine whether they would support the pilot study. The proposed intervention would focus on promoting sugar free versions generally, as well as of Coke (Coke Zero and Diet Coke) over the original Coke product.

Local shop retailers:

Local shop retailers were asked to support this study in any of a number of ways.

Social-marketing partnerships: As part of the social-marketing poster competition, retailers were asked if they would mind if students could approach them for advice on what they see as important characteristics of social marketing / advertising of products.

Display areas: Retailers were asked if they would support the study by providing shop front space (free) upon which social marketing resources may be displayed over the course of this study.

Ethics

Ethical approval was awarded for this study by the University of Auckland Human Participants Ethics Committee on 9th April, 2013, Reference number 9116.

Baseline results

Schools:

School Response Rate: After gaining ethics approval, the 5 schools that indicated their support at the planning phase were successfully recruited onto the study. The one school that did not initially agree to participate cited a number of reasons for this decision that included i) a concern that the study would consume more teacher and student's time than indicated/anticipated, ii) scepticism that the intervention would be of little effect, and iii) the fact that their school had been and were still currently involved in a number of other research projects - indicating possible research fatigue. However the school did agree for our team to visit their school to invite their students to participate in the 2 competitions. During these engagements and after building a stronger relationship with the school they eventually agreed to participate in the study formally. In total 6/6 schools approached agreed to participate (100% response rate). The combined roll of these schools is approximately 3,000 students from years 1 - 13 (aged 5 to 17 years).

Surveys: At baseline 910 surveys were conducted, and at follow-up 813. Table 2 presents the number of surveys by each primary, intermediate, and high school. Surveys were only conducted by year 5 and 6 (in primary schools), years 7 and 8 (all intermediate age students), and years 9 and 10 in high schools.

The response rate for both surveys was 75%. This was based on the attendance records for these schools (75%). All students that attended school on the day the survey was conducted participated. There was a notable difference at Follow-up for school F (from 242 at baseline to 139 at follow-up) due to school holidays (some students were still on holiday).

Environmental AUDITS were also completed with all 6 schools.

School healthy beverages policy: a meeting was held with all six schools where the beverage policy was discussed at length. In this discussion, a suggestion was made by one principal to develop a uniform policy acceptable for all schools. This was agreed to by all schools. Currently this policy in its second draft awaiting final revisions before it is then taken to each of the schools respective board of trustees for approval.

Table 2. Students Beverages Survey at Baseline and Follow-up

School	Baseline (Feb-March)	Totals	Follow-up (Oct-Nov)	Totals
A Primary	40		63	
B Primary	129	265	104	265
D Primary	96		98	
C Intermediate	216	216	226	226
E High	187	429	183	322
F High	242		139	
Total	910	910	813	813

Community organisations

Churches: Churches proved more difficult to engage with than anticipated. In total 9 church leaders were approached to be part of this study and formal meetings were arranged with three. Of these, a presentation was given to one congregation, which is in the process of developing a beverage policy. One church leader informed us after our initial meeting, that they went back to their main management committee and it was decided that there was little need for a beverage policy as the availability of sugary drinks was already minimal.

Community Groups (sports clubs, community centres/hub): The community Hub have been a strong supporter of this study from the outset. They also provided instrumental links to school principals. The community Hub were approached to determine support for such a study prior to preparing a proposal. At this stage a beverage policy has been prepared and is awaiting approval from the management committee. At the Hub's 1 year birthday celebration that was held in November 2013, only water was available for children that attended the celebration.

Sports Club: As with churches the only sports club in the area proved difficult to engage with. A number of e-mails and phone messages were sent/left with club officials but no response was received.

Retail sector

Local shops: It proved difficult to engage with the local retail sector with this study. On a number of occasions a request was made for the local shops to display the healthy beverage poster the study developed on their shop-fronts. Although many of the retailers indicated that they would display these and were happy for us to leave the posters for them to put up, very few were displayed (approximately 4 over a period of 4 weeks) and those that were - only for a short period of time. (2-3 days)

There have been anecdotal accounts from teachers of participating schools that local retailers have complained that their drink sales have been affected as a result of this study.

Mall: The initiative with the Mall was primarily focussed on McDonald's restaurant. A meeting with the owner was arranged where the proposal to conduct a pilot study that would promote the sugar free beverage range and/or make them the default beverage options was explained. A comprehensive description of the Sprite Zero switch, carried out many years ago with McDonalds was identified as a template for this new initiative. This was very well received by the owner, who acknowledged that whether it could go any further would depend on higher level approval from respective national managers of both McDonalds and Coca-cola. The owner then provided the appropriate contacts, which we followed up on.

In November, 2013 a meeting was held with the General Manager, and the Official Spokesman of Coca-Cola Oceania, as well as the National Communications Manager of McDonalds to discuss the possibility of designing such a study as described above. These discussions were positive and ended in the mutual agreement that the pilot study may be possible and an invitation to our study team to prepare a short written description of what the study may look like for their further consideration.

Discussion

The Kelston Beverages Pilot Study successfully engaged with community and schools and has provided valuable learnings that will inform a number of future research initiatives. Primarily, this pilot study will inform the development of a proposal for a 2-year cluster randomised intervention study that will combine a school intervention with a community partnering approach to reduce youth intake of sugary drinks. An unanticipated consequence of this study has been the emergence of discussion with industry around the likelihood of conducting a pilot study that will promote sugar free beverages and/or makes sugar free beverages the default option in their core business. Although still at very early stages, the potential reduction in the amount of sugar consumed through beverages an initiative like this could generate at population level would be substantial.

A novel aspect that this study employed was the recruitment of the services of a well-known NZ musician to lead and carry-out the school based intervention. A consequence of this was the warm reception the study received by all schools involved. The principal of the school that initially did not want to participate, explained that - had he previously known this iconic NZ musician was leading the intervention - "that would have changed things", and it eventually did as the school subsequently was recruited onto the study in full. It was clear, that having a well-respected celebrity figure, which resonated with teachers, parents and students alike - leading the study, enhanced the profile of the study to the local community as well as local and national media. The study was profiled with a full front cover story on the local paper, as well as being profiled on two national TV networks and a number of national radio stations. No doubt, the involvement of our well-known NZ musician was a major lever that attracted favourable media attention.

Another reason for study success was the recruitment of a young, ambitious local resident as project manager for the study. This person had already established links to many organisations and individuals in the study community. As a member of this community the project manager also held an in-depth understanding of community dynamics, values and processes. The project manager was also quite youthful and only recently

completed a tertiary qualification. This meant that she was able to provide accurate advice on how to best design and deliver the intervention to maximise its appeal to the youth that the study focussed on.

The inability to work effectively with the local churches and sports club was unexpected, and an area that will require more attention should a larger scale study be initiated. The resistance from the local shop retailers is something that was expected and will also require more attention in future studies of this nature. If this study was better resourced, a greater effort could have been made in these settings, however, limited study resources hampered our ability to devote an adequate amount of time and effort to these aspects of the intervention.

Although the effectiveness of the intervention has not been determined, and was not the key aim of the pilot study, it is evident that the length of time an intervention lasts will heavily influence the effectiveness of it, especially when a large component of the suite of interventions used employs a social-marketing type approach. This study was designed to be carried out within 1 school year, and was carried out over an 8 month period from March to October, 2013. For a larger-scale study we believe it best that the intervention take place over a 2 year period.

Conclusion

The results and critical learnings from this pilot study have provided valuable understandings of how to better design and carry-out a study of this nature on a larger-scale in communities. Most importantly, this study has shown that a study of this kind is feasible and is highly likely to gain the critical support needed from key sectors of the participating communities. This study has successfully piloted a novel suite of community based interventions aimed at reducing the consumption of sugary drinks in youth with promising results with regards to acceptability, feasibility, and recruitment rates.

ACKNOWLEDGMENTS: The Kelston Beverages Study was funded by the Health Research Council of New Zealand and was carried out by the University of Auckland. Other collaborators that have contributed to the study design and implementation include: Dr Jacqui Bay, Dr Tasileta Teevale, Dr Amanda Dunlop, Nathaniel Gaudin, Samuel Fifita, Leva Faafua, Ema Latu, David Faafua, Teisa Fifita, Mihi Angell, Alex Sutherland, and Joseph Griffin. Most importantly we are most grateful to the participating organisations and schools, principals, teachers, parents, and students that were part of this study.

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