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The Live 5-2-1-0 Toolkit for family physicians: Mixed methods evaluation of a resource to facilitate health promotion in a primary care setting

A pilot study in two BC communities found that a toolkit promoting healthy lifestyle behaviors helped FPs initiate discussions about pediatric obesity with patients and develop plans for monitoring.

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ABSTRACT

Background: Sustainable Childhood Obesity Prevention Through Community Engagement is an initiative that engages stakeholders across multiple sectors to promote the Live-5-2-1-0 message (5 vegetables and fruits, 2 hours at most of recreational screen time, 1 hour of physical activity, 0 sugar-sweetened beverages each day) and implement action to support healthy behaviors. As part of this initiative, an intervention using the Live 5-2-1-0 Toolkit for family physicians (FPs) was piloted in two communities. This study aimed to identify barriers and aids to toolkit implementation, and to determine whether the toolkit improves physicians' capacity to promote healthy childhood behaviors.

Methods: FPs completed preintervention and postintervention surveys and participated in semi-structured interviews after implementation of the Live 5-2-1-0 Toolkit intervention. Implementation occurred sequentially in two communities and involved a total of 21 FPs in six primary care clinics. Descriptive statistics were used for quantitative data, and content analysis was used for qualitative data.

Results: Of the 21 participating FPs, 14 completed the preintervention and the postintervention surveys (67%) and 7 completed the preintervention survey only (33%). FPs reported increased knowledge of medical evaluation of pediatric patients with obesity (from 14% preintervention to 36% postintervention), behavioral goal setting (from 36% to 93%), and motivational interviewing (from 57% to 79%). FPs' perceived efficacy in addressing the subject of weight improved (from 43% preintervention to 93% postintervention). Increases were also observed in routinely addressing nutrition (from 43% preintervention to 79% postintervention), physical activity (from 50% to 79%), screen time (from 14% to 64%), and sugar-sweetened beverage consumption (from 29% to 71%). As a result of toolkit implementation, 71% of FPs felt their patients were more aware of long-term complications related to lifestyle, 64% felt patients were more willing to set behavioral goals with providers, and 50% felt patients were more able to self-manage issues related to lifestyle. The predominant barrier to implementation was lack of staff/clinic capacity to measure BMI; the most noted aid to implementation was access to ready-to-use Live 5-2-1-0 resources.

Conclusions: The Live 5-2-1-0 Toolkit facilitated health promotion to pediatric patients in the primary care setting. Increasing routine BMI measurement in primary care remains challenging due to clinical capacity issues. Results of this pilot study will be used to refine the toolkit prior to wider dissemination across British Columbia.

Background

The prevalence of childhood obesity continues to increase in Canada and worldwide, posing a major public health challenge.[1,2] Childhood obesity is complex, with several factors contributing to an obesogenic environment (e.g., exposure to energy-dense and nutrient-poor foods, limited physical activity opportunities, and increased screen time/sedentary activity).[3] The 2015 *Lancet* series on obesity described patchy progress in prevention globally.[4] However, whole-of-community, multisetting, multistrategy interventions have shown promise in achieving population-level reductions in childhood overweight and obesity across the globe.[5-9] These interventions engage with the complexity of childhood obesity and address the various components of the obesogenic environment at several levels, thereby facilitating tailored, community-centric local action.[10] Sustainable Childhood Obesity Prevention Through Community Engagement (SCOPE) is a Canadian example of such an intervention. SCOPE partners with communities to empower local stakeholders across multiple sectors (e.g., schools, media, businesses, health services, community/recreation centres, local governments) to share (via social marketing) and support (via policy, practice, and environmental change) the evidence-based Live-5-2-1-0 message:

- 5 vegetables and fruits every day.
- 2 hours at most of recreational screen time a day.
- 1 hour at least of physical activity each day.
- 0 sugar-sweetened beverages each day.[11,12]

Primary care serves as an ideal setting for monitoring children's weight trajectories and addressing health behaviors/habits given the long-standing relationship between family physicians and families.[13] However, primary care physicians have reported barriers to promoting healthy weights, including lack of self-efficacy, capacity, resources (e.g., staffing support and educational materials/counseling tools), and time.[14-17]

The SCOPE team worked with two communities to create, use, adapt, and evaluate the Live 5-2-1-0 Toolkit for family physicians (FPs) to address these barriers and empower primary care providers to promote healthy behaviors and weights. The toolkit, discussed in greater detail under Methods, integrates routine BMI tracking and growth monitoring, training on motivational interviewing, and resources to support assessment and discussion of healthy behaviors and facilitation of community program referrals. The objectives of our pilot study were to:

1. Determine whether the toolkit improved physicians' capacity to promote healthy childhood behaviors.
2. Identify barriers and aids to toolkit implementation.

Methods

The Live 5-2-1-0 Toolkit intervention was implemented in one urban and one rural community, both of which were existing SCOPE partner communities with primary care leadership involvement. Community A, population 80 000, is a city in British Columbia's Fraser Valley, located 105 km east of Vancouver, the province's largest urban centre. Community B, population 6600, is a rural community located in the Kootenay Rockies region of BC.

Participants

Family practice clinics in communities A and B were selected using convenience sampling, and were contacted by a member of the research team to gauge the clinics' collective interest in participating in the study. Individual FPs in clinics that expressed interest were then invited to participate; participating FPs were required to have a current primary care practice in either community A or B, and participation was voluntary. In total, 21 FPs from six primary care clinics participated. A small sample size was accepted because this pilot study's purpose was to evaluate feasibility of toolkit implementation in the clinical setting and inform toolkit refinement prior to larger-scale evaluation.

Study design

A preintervention and postintervention observational mixed methods study design was used. Data were collected from participating FPs before and after the intervention (9 months during 2014 in community A, and 12 months during 2015–16 in community B) using a survey adapted from the Maine Youth Overweight Collaborative's "Keep ME Healthy" initiative[18] that could be completed via an online link or on paper. Participants were guaranteed anonymity to reduce social desirability bias. To measure physicians' capacity to promote healthy childhood behaviors, survey questions assessed physicians' knowledge, beliefs, self-efficacy, and practices pertaining to BMI measurement, management of pediatric overweight and obesity, and discussion of healthy lifestyle behaviors. Physician demographic data were also collected. The intervention and surveys were first implemented in community A, and were subsequently modified based on lessons learned prior to implementation in community B.

All participating FPs were invited to complete a postintervention, semi-structured, in-person qualitative interview, approximately 20 to 30 minutes in length and conducted by a SCOPE researcher, to explore barriers and aids to project implementation and to elicit suggestions for improving the toolkit and implementation processes **[Table 1, next page]**. Quantitative data derived from the surveys informed the qualitative interview questions related to changes in FP practice, observed behavior change among patients, barriers and aids to project implementation, project sustainability, toolkit usefulness, and overall project impact.

Intervention

The toolkit intervention was based on recommendations by Barlow,[19] and was consistent with recent recommendations on childhood obesity management and prevention in the primary care setting.[20] Key components of the intervention included the following:

1. Integrating routine BMI tracking and growth monitoring as an obesity prevention strategy. Growth monitoring/BMI tracking has been strongly recommended by the Canadian Task Force on Preventive Health Care given its low cost, feasibility, low probability of harm, and potential value in early identification of weight-related health conditions.[20]

TABLE 1. Qualitative interview questions for pilot study of Live 5-2-1-0 Toolkit intervention.

1. I'm interested to know your perspective on the issue of childhood obesity in the patient population you currently serve. (Probes: What proportion of your patient population are children and youth < 18 years of age? Approximately how many are considered overweight/obese?)
2. What were the main reasons that motivated you to participate in this project?
3. Were you aware of the 5-2-1-0 message prior to this project?
4. Have you made any changes to the way that you practise as a result of this project? a. Do you think this change/these changes will be sustainable in your practice? Why or why not?
5. Have you seen any changes in your patients as a result of this project? a. If yes, what have you noticed? b. If no, what do you see as the main barriers your patients experience to making changes?
6. What aspects of this project were the easiest for you to implement? (Probes: What was the easiest change to make to the way you practise? What was it that made these changes easy?)
7. What aspect(s) of this project do you think was the most valuable? (Probes: To you? To your patient population?)
8. What aspects of this project were the most difficult to implement? (Probes: What was it that made that difficult? What needs to be changed to reduce that difficulty?)
9. Can you comment on how useful each section of the family physician toolkit was in implementing health promotion practices among your pediatric patients? [Interviewer: Have the toolkit present as a reference.] a. How to measure and plot BMI b. Talking with patients and families about healthy eating and active living (and implementing motivational interviewing techniques) c. Physician resources d. Assessment and Management Flow Chart
10. Do you have any suggestions for additional elements or improvements to the family physician toolkit?
11. What else could be done to help you continue or strengthen efforts within your own practice to improve the prevention and management of childhood and youth obesity?
12. What else do you think needs to be done to prevent and manage childhood and youth obesity?

2. Training on motivational interviewing as a patient-centred counseling technique that allows individuals to discover their own reasons for change. A number of randomized control trials on motivational interviewing in the primary care setting have illustrated its promise in eliciting positive behavior change[21,22] and reducing BMI in overweight pediatric patients.[23]
3. Providing tools and resources to support assessment and discussion of daily habits and lifestyle behaviors, and to facilitate community program referral through primary care in order to link affordable and available resources/services to individuals who may need additional support beyond that available through their family physician. Lack of available resources and community supports has frequently been described as a barrier for physicians attempting to address childhood obesity in the primary care setting.[16,24]

The toolkit intervention was implemented through an expert-led group training session for physicians and clinic staff. The training session was 2 hours and consisted of three presentations: (1) how to conduct motivational interviewing, conducted by a child psychologist, (2) how to respectfully discuss weight during patient interactions, conducted by the primary investigator, and (3) how to use the binder of toolkit elements and resources, conducted by the research manager.

The toolkit binder included resources on employing motivational interviewing techniques, a flow chart on managing children with overweight or obesity (i.e., appropriate laboratory investigations and referral to relevant community- or hospital-based programs), and instructions for integrating World Health Organization growth charts and BMI measurements into an electronic medical record. Further, the toolkit binder included additional resources such as the Live 5-2-1-0 Healthy Habits Questionnaire to assess current behaviors, a community-specific Healthy Living Support Booklet that identified local and provincial programs that support healthy behaviors to which patients could be referred, and supplementary Live 5-2-1-0 resources such as prescription pads, fact sheets, posters, magnets, and goal-tracking tools. The elements of the toolkit binder are available online at www.live5210.ca/resources/health.

Data analysis

Ethics approval for the study was obtained from the University of British Columbia Children's and Women's Health Centre of British Columbia Research Ethics Board. Descriptive statistics were used to analyze quantitative data (proportions, means, and frequencies). Semi-structured interviews were audio recorded and transcribed verbatim. Directed content analysis was used to generate preliminary coding categories;[25] a coding guide was generated by two researchers (SS, SP) who then independently reviewed all the transcripts before deliberating and finalizing the coding guide. A third researcher (SA) reviewed the transcripts independently using the finalized coding guide, after which all three researchers worked together to resolve inconsistencies. Key themes and subthemes were then identified.

Results

Of the 21 participating FPs, 14 completed the preintervention and the postintervention surveys (67%) and 7 completed the preintervention survey only (33%). Six FPs from community A also completed postintervention semi-structured interviews (28%). The demographic and practice characteristics of survey respondents indicated that physicians who did not complete the postintervention survey were disproportionately male and younger than those who did **[Table 2]**.

Family physician survey

Improvements were noted postintervention in (1) FPs' self-reported knowledge of medical

TABLE 2. Demographic and practice characteristics of 21 pilot study survey respondents.

Physician characteristics	Pre- & post-intervention survey respondents (n = 14)	Pre-intervention survey respondents (n = 7)
Age category (years)		
30–34	14%	14%
35–39	7%	29%
40–44	14%	43%
45–49	36%	0%
50–54	7%	14%
54–59	7%	0%
60+	14%	0%
Sex		
Male	36%	86%
Female	64%	14%
Mean number of patients seen per year (SD)*	4025 (3686)	3750 (1631)
Mean proportion of pediatric patients (SD)*	13% (10)	8% (4)
Years in their current position		
3–5	14%	14%
5–10	14%	43%
> 10	71%	43%

*SD = standard deviation

evaluation of pediatric patients with obesity, behavioral goal setting, and motivational interviewing **[Figure 1]**; (2) FPs' perceived self-efficacy in addressing topics such as weight, nutrition, screen time, physical activity, and consumption of sugar-sweetened beverages **[Figure 2]**; and (3) FPs' routine promotion of the Live 5-2-1-0 health behaviors **[Figure 3]**. Following the toolkit intervention, 71% of FPs felt their patients were more aware of long-term complications related to lifestyle, 64% felt patients were more willing to set behavioral goals with providers, and 50% felt patients were better able to self-manage issues related to lifestyle. An increase was also observed in routine annual BMI tracking for all pediatric patients (from 7% preintervention to 29% postintervention).

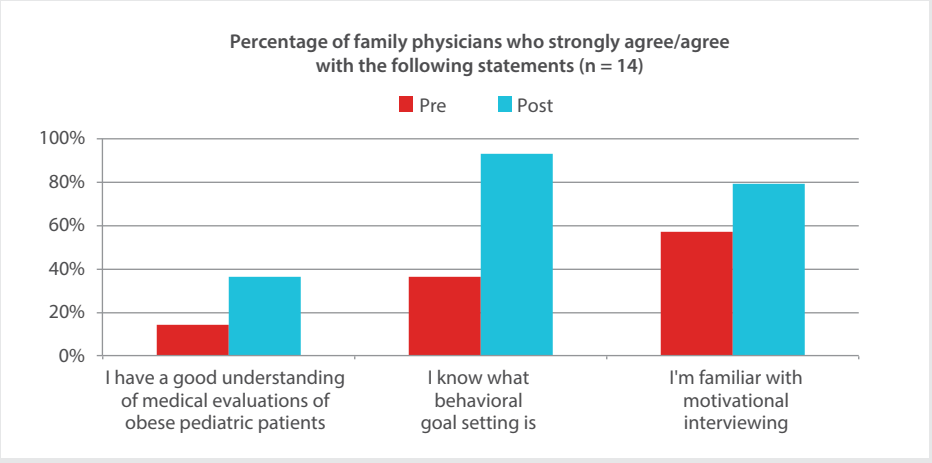

FIGURE 1. Self-reported knowledge of survey respondents before (pre) and after (post) the Live 5-2-1-0 Toolkit intervention.

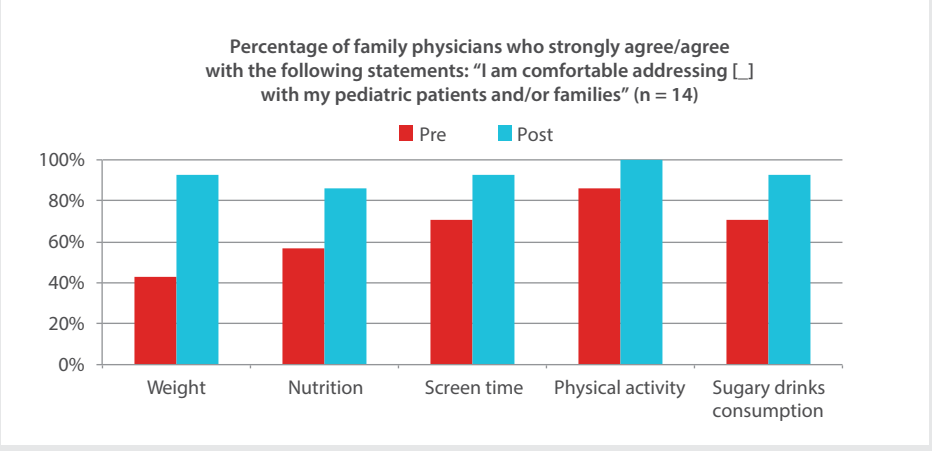

FIGURE 2. Perceived self-efficacy of survey respondents when addressing topics related to weight and health behaviors before (pre) and after (post) the Live 5-2-1-0 Toolkit intervention.

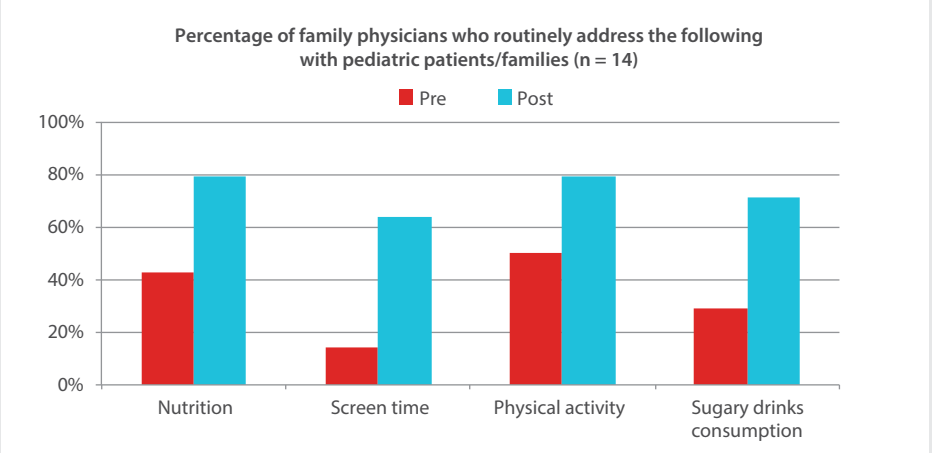

FIGURE 3. Routine health promotion practices of survey respondents before (pre) and after (post) the Live 5-2-1-0 Toolkit intervention.

Qualitative interviews

Three key themes emerged from the qualitative analysis:

1. **The Live 5-2-1-0 message facilitates practice change.**
   FPs found the Live 5-2-1-0 messaging "recognizable," "clean," "easy to remember," "easy to explain," and "a common language and a common ground to go on" (FP1, FP2).

   FPs felt that the Live 5-2-1-0 message helped destigmatize discussions on healthy living and empowered physicians to be proactive with health promotion. The message allowed them to "open the discussion in a nonjudgmental way" (FP1) because it was "standardized" (FP6), and they were "doing this to all kids," which "takes away the stigma associated with obesity" (FP1). Another physician said that the resources "made [them] far more proactive and therefore preventative," and provided them "more leverage as a physician to open that conversation which, otherwise, [they]. . . wouldn't have had" (FP5). One physician said, "I know what to do now when I get people to come back. . . whereas before if I was worried about their weight I'd get them to come back and then I didn't really have a good plan of what to do, what blood work to do, to refer them, not to refer them, all that sort of stuff. Now I know" (FP6).
2. **Front-end office coordination and staff capacity are necessary.**
   FPs found they depended on administrative staff to conduct BMI measurements and administer the Healthy Habits Questionnaire. They reported that sustainability of toolkit implementation was contingent on the capacity of front-end administrative staff and that "secretaries were the main ones involved in starting the process. . . if they weren't involved in this process this would never have happened" (FP1). FPs reported that measuring BMI in all pediatric patients was not sustainable, and that office support staff "were not going to continue doing it" (FP6) because measuring heights and weights in a private space and calculating BMI percentiles could be quite time-consuming.
3. **A collective approach that involves all sectors of a community is necessary.**
   FPs acknowledged the importance of a collective, consistent, community-wide approach to achieving healthy childhood weights: "education needs to not only be done in the doctor's office but in the schools, in public health, in the leisure centres, in the rec centres, in everywhere that kids are going to be, in everywhere that families are going to be" (FP6). According to another physician, "using the same language" across a community "is going to hopefully reinforce the same messages. . . and if we repeat it often enough and people hear it often enough it might then be the key to, to making it happen" (FP2).

Conclusions

The implementation of whole-community, multisectoral, childhood obesity prevention using the Live 5-2-1-0 Toolkit was found to enhance physicians' knowledge and self-efficacy when managing pediatric patients with obesity, and caused positive changes in physicians' health promotion practices. The predominant aid to implementation for FPs was the simplicity and clarity of the Live 5-2-1-0 message, while a major barrier to implementation was the lack of front-end staff capacity. Finally, the importance of a whole-community approach that mobilized all sectors was identified as an important theme.

Managing obesity

A systematic review of primary care interventions for managing childhood obesity supports our study finding that empowering providers through training (e.g., in motivational interviewing) and education leads to increased knowledge, skills, and confidence in managing pediatric obesity. Empowering providers also increases adherence to expert committee recommendations.[26] Studies of other similar primary care interventions built on the Live 5-2-1-0 guidelines[19] have reported positive changes in physicians' practices related to child and adolescent obesity.[18,27,28] Gibson, for example, noted significant increases in behavioral education/counseling (from 9% to 87%) within two rural health clinics.[27]

Routinely using Live 5-2-1-0 resources to address behaviors was found to empower physicians in our pilot study by destigmatizing weight and standardizing the process of brief counseling sessions for weight- and health-related behavior. This seemed to lessen commonly reported barriers faced by physicians when discussing childhood obesity, which include the sensitive nature of the topic and lack of knowledge, comfort, and self-efficacy.[15-17,29,30] We observed increases in physician-reported knowledge and self-efficacy that translated into practice change, with an increase in the routine promotion of healthy behaviors and the use of behavioral goal setting. Similar improvements in self-efficacy that translated into practice changes were found by Barlow and colleagues after brief training and support for primary care providers.[31] However, only half the participating FPs in our study felt that their patients were better able to self-manage issues of lifestyle as a result of the intervention, which underscores the potential impact that external environmental and systemic barriers can have on individual habits. This in turn reinforces our qualitative finding that physicians feel complementary community-wide health promotion efforts and supports are also necessary, a finding borne out by other studies.[32,33]

Our qualitative findings also showed that the Live 5-2-1-0 message and accompanying resources were major drivers of physician-related changes. Several studies that outline barriers to pediatric obesity prevention and management in primary care report the need for better tools to support counseling and communication with patients and families.[16,17,24] The Live 5-2-1-0 message, tools, and resources may fill this gap by providing primary care physicians with the means to open conversations with families about weight and health behaviors in a simple and nonjudgmental manner.

Study limitations

Our study had several limitations, including the lack of a control group, a small sample size, the lack of completed postintervention surveys from 7 of 21 participating physicians, and a short intervention period that varied between study sites. Self-selection bias may have skewed the sample and led to the recruitment of only those

FPs who are passionate about health promotion. If this were the case, we would expect physicians without a special interest in health promotion to benefit even more from the toolkit than those who participated in our study. The duration of toolkit use in both communities was based on the capacity of the clinics at the time of the pilot study. We would not expect that the variability of the study periods between communities would impact the comparability of the findings between communities. Lastly, social desirability bias may have influenced survey responses. Given the various limitations, results from this pilot study are not easily generalizable.

Summary

Childhood obesity continues to increase in Canada and worldwide, posing a major public health challenge. A pilot study in two BC communities found healthy behaviors that prevent childhood obesity can be achieved in the primary care setting by using a simple Live 5-2-1-0 message: 5 vegetables and fruits, 2 hours at most of recreational screen time, 1 hour of physical activity, 0 sugar-sweetened beverages each day. The Live 5-2-1-0 Toolkit intervention was found to destigmatize discussions about weight and healthy habits and provide a foundation for brief counseling sessions. Further research is needed to explore interventions and strategies that reduce the burden of routine BMI measurement on office staff. ■

Competing interests

None declared.

FPs felt that the Live 5-2-1-0 message helped destigmatize discussions on healthy living and empowered physicians to be proactive with health promotion.

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