



---

## **Process and impact evaluation of the romp & chomp obesity prevention intervention in early childhood settings : lessons learned from implementation in preschools and long day care settings**

AUTHOR(S)

A de Silva-Sanigorski, Colin Bell, Peter Kremer, J Park, L Demajo, M Smith, S Sharp, Melanie Nichols, L Carpenter, Rachel Boak, Boyd Swinburn

PUBLICATION DATE

01-06-2012

HANDLE

[10536/DRO/DU:30045859](https://hdl.handle.net/10536/DRO/DU:30045859)

Downloaded from Deakin University's Figshare repository

Deakin University CRICOS Provider Code: 00113B

# Deakin Research Online

## **This is the published version:**

de Silva-Sanigorski, Andrea M., Bell, Andrew C., Kremer, Peter, Park, Janet, Demajo, Lisa, Smith, Michael, Sharp, Sharon, Nichols, Melanie, Carpenter, Lauren, Boak, Rachel and Swinburn, Boyd 2012, Process and impact evaluation of the romp & chomp obesity prevention intervention in early childhood settings : lessons learned from implementation in preschools and long day care settings, *Childhood obesity*, vol. 8, no. 3, pp. 205-2015.

## **Available from Deakin Research Online:**

<http://hdl.handle.net/10536/DRO/DU:30045859>

**Reproduced with the kind permission of the copyright owner.**

**Copyright :** 2012, Mary Ann Liebert, Inc.

# Process and Impact Evaluation of the *Romp & Chomp* Obesity Prevention Intervention in Early Childhood Settings: Lessons Learned from Implementation in Preschools and Long Day Care Settings

Andrea M. de Silva-Sanigorski, B.Sc., M.H.N., Ph.D.,<sup>1,2</sup> Andrew C. Bell, Ph.D.,<sup>3</sup> Peter Kremer, Ph.D.,<sup>4</sup>  
Janet Park, B.Ed.,<sup>5</sup> Lisa Demajo, Adv Diploma Community Services,<sup>6</sup> Michael Smith, BDSc, L.D.S.,<sup>7</sup>  
Sharon Sharp, D.A.,<sup>7</sup> Melanie Nichols, Ph.D.,<sup>8</sup> Lauren Carpenter, BAppSci, BAppSc, B.A.,<sup>1</sup>  
Rachel Boak, M.Sc.,<sup>1</sup> and Boyd Swinburn, MBChB, M.D., FRACP<sup>9</sup>

## Abstract

**Background:** The *Romp & Chomp* controlled trial, which aimed to prevent obesity in preschool Australian children, was recently found to reduce the prevalence of childhood overweight and obesity and improve children's dietary patterns. The intervention focused on capacity building and policy implementation within various early childhood settings. This paper reports on the process and impact evaluation of this trial and the lessons learned from this complex community intervention.

**Methods:** Process data was collected throughout and audits capturing nutrition and physical activity-related environments and practices were completed postintervention by directors of Long Day Care (LDC) centers ( $n = 10$ ) and preschools ( $n = 41$ ) in intervention and comparison ( $n = 161$  LDC and  $n = 347$  preschool) groups.

**Results:** The environmental audits demonstrated positive impacts in both settings on policy, nutrition, physical activity opportunities, and staff capacity and practices, although results varied across settings and were more substantial in the preschool settings. Important lessons were learned in relation to implementation of such community-based interventions, including the significant barriers to implementing health-promotion interventions in early childhood settings, lack of engagement of for-profit LDC centers in the evaluation, and an inability to attribute direct intervention impacts when the intervention components were delivered as part of a health-promotion package integrated with other programs.

**Conclusions:** These results provide confidence that obesity prevention interventions in children's settings can be effective; however, significant efforts must be directed toward developing context-specific strategies that invest in policies, capacity building, staff support, and parent engagement. Recognition by funders and reviewers of the difficulties involved in implementing and evaluating such complex interventions is also critical to strengthening the evidence base on the effectiveness of such public health approaches to obesity prevention.

## Introduction

The importance of early intervention to developing and maintaining health-promoting behaviors and healthy weight in early childhood is now

recognized. Children's educational and care settings are considered important points for such intervention activities.<sup>1-6</sup> Early childhood settings include family-based child care, center-based child care, and preschool (also

<sup>1</sup>Jack Brockhoff Child Health and Wellbeing Program, Melbourne School of Population Health, The University of Melbourne, Carlton, Australia.

<sup>2</sup>Dental Health Services Victoria, Carlton, Victoria, Australia. <sup>3</sup>School of Medicine and Public Health, University of Newcastle, Callaghan, NSW,

Australia. <sup>4</sup>Melbourne School of Population Health, The University of Melbourne, Carlton, Australia. <sup>5</sup>Geelong Kindergarten Association,

Geelong West, Victoria, Australia. <sup>6</sup>City of Greater Geelong, Newtown, Victoria, Australia. <sup>7</sup>Barwon Health, Newcomb, Victoria, Australia. <sup>8</sup>WHO

Collaborating Centre for Obesity Prevention, Deakin University, Geelong, Victoria, Australia. <sup>9</sup>WHO Collaborating Centre for Obesity Prevention, Deakin University, Melbourne, Victoria, Australia.

known as kindergarten and nursery); however, a recent Cochrane systematic review of interventions aiming to prevent childhood obesity identified that limited evidence is available on effective interventions in such settings.<sup>7</sup> Although limited, evidence from interventions targeting policies and practices in children's settings provide promising results and have been shown to influence children's nutrition in schools<sup>8</sup> and levels of physical activity in child care.<sup>9</sup>

There is growing evidence from older children that complex community-based, multisetting and multistrategy interventions can reduce the risk of childhood obesity.<sup>7,10–13</sup> The application of this approach in early childhood through the *Romp & Chomp* intervention, was recently found to reduce the prevalence of childhood overweight/obesity by an average of 3 percentage points in 2- and 3.5-year-old children and improve children's dietary patterns when compared to the control group.<sup>14</sup>

*Romp & Chomp* was a large-scale demonstration project in Victoria, Australia,<sup>15</sup> that aimed to reduce obesity and promote healthy eating and active play in children aged 0–5 years old and their families. The intervention was conducted across a range of early childhood settings, and strategies were guided by the socioecological model of health and health-promotion principles.<sup>16,17</sup> Activities focused on capacity building and policy implementation (nutrition and active play), and the early childhood settings involved were center-based Long Day Care (LDC), preschools (kindergartens), family (home-based) day care (FDC), and the Maternal and Child Health Service. This paper focuses on the process evaluation and impacts of the intervention in LDC and preschool settings only.

LDC is a government-accredited, center-based child care service, and preschool (kindergarten) is a center-based early childhood education program delivered by a qualified teacher<sup>18</sup> to children aged 3–5 years. In Australia, the majority of LDC centers usually provide the food and drink a child has while attending; however, in preschools, the food and drink are usually provided by parents. Furthermore, in Australia, there are both publicly owned and private-for-profit LDC centers, whereas all preschools are not-for-profit. This paper aims to determine if the LDC centers and preschools in the intervention area were more health-promoting after the *Romp & Chomp* intervention when compared with LDC centers and preschools from other areas of Victoria. Specifically, we examined differences between the intervention and comparison groups in aspects of the policy, sociocultural, and physical environments as they relate to children's nutrition and physical activity. The barriers encountered and lessons learned during the intervention implementation and evaluation are also a focus of this paper.

## Methods

### *The Romp & Chomp Intervention*

*Romp & Chomp* was a community-based and community-wide obesity prevention intervention (2004–2008) in the City of Greater Geelong and the Borough of Queenscliffe in Victoria, Australia. The intervention targeted all children (about 12,000) aged 0–5 and their families living in the intervention area and was delivered primarily through early childhood settings (LDC, FDC, preschools, and the Maternal and Child Health Service).

The intervention approach was family-centered, settings-based, and aimed at societal change.<sup>15,19</sup> In the context of *Romp & Chomp*, taking a settings-based approach resulted in decision-making by the managers and staff of the individual settings about the implementation of intervention strategies. In addition, a settings-based approach to health-promotion attempts to effect changes on the physical, social, and economic environments to make them more conducive to good health,<sup>19</sup> and as such the focus was not on individual behavior change.

Table 1 provides an overview of the intervention objectives and strategies implemented in the LDC and preschool settings. This detail from the process evaluation is considered critical to understanding the impacts and outcomes of this complex intervention.<sup>20</sup> Intervention activities in the LDC setting were predominantly focused on developing and disseminating resources and social marketing materials to parents and staff, implementation of an active play policy, and increasing children's active play through the development of, and staff training for, an Active Play Program.<sup>21</sup> A number of intervention and comparison LDC centers had recently been completed or were in the process of completing the *Start Right Eat Right* (SRER) program,<sup>22</sup> in which they were required to redevelop their food service menus and nutrition policies. Therefore, *Romp & Chomp* intervention activities focused on supporting the intervention LDC centers to continue implementing SRER and to review existing nutrition policies and menus.

Similar intervention activities occurred in the preschool setting, although they were modified to suit the different contexts; for example, preschool is an education setting rather than child care setting, and children bring their lunch and snack items from home rather than these items being provided by the center. In addition, the approach to the implementation in the preschool setting evolved over the intervention period as it became evident that the oral health-promotion program *Smiles 4 Miles* was being piloted, and the State-wide health-promotion program *Kids—'Go For Your Life'* (KGFYL)<sup>23</sup> was in development for implementation in preschools across the State, including the intervention region.

*Smiles 4 Miles* is a settings-based health-promotion program that operates within health-promoting schools and capacity-building frameworks to improve the oral

**Table 1. Summary of the Health Promotion Activities Implemented in the Long Day Care and Preschool Settings During the *Romp & Chomp* Intervention**

<b>Capacity building and skill development<sup>a</sup></b>
Development and distribution of newsletters, information cards (healthy eating and active play), and promotional materials to early childhood workers, parents, and children
Training for allied health and dental staff to implement the integrated health-promotion package in preschools <sup>b</sup>
Support (e-mail, phone, or site visit) of health-promotion activities in early childhood settings by allied health professionals <sup>b</sup>
Professional development for early childhood workers and service staff to reinforce healthy eating messages <sup>b</sup>
Care providers trained in fundamental movement skills and providing active play opportunities for young children
Development, pilot testing, and implementation of a physical activity policy for early childhood care and educational settings
Presentations at community forums, early childhood, and health conferences
<b>Facilitation<sup>c</sup></b>
Media coverage and community awareness-raising activities
Development, testing, and implementation of an integrated health-promotion intervention package
Integration of policies related to nutrition and active play into parent handbooks
“Structured Active Play Program” developed, produced, and disseminated
Active play training incorporated into the vocational training for early childhood workers
Collaboration with <i>Kids—‘Go For Your Life’</i> and Dental Health Services Victoria for healthy eating and drink choices resources <sup>b</sup>
Support for settings staff (mail, phone, or site visit) by dental or allied health professionals as required <sup>b</sup>
<b>Advocacy<sup>d</sup></b>
Ministerial project launch and awareness-raising activities with community organizations, parents, health professionals, and early childhood workers
Presentations at community forums and early childhood and health conferences
Development and facilitation of partnerships, strategic alliances, and community organizational networks
Social Marketing: Overarching campaign message developed—“Children under 5 need daily active play and healthy food choices provided”

<sup>a</sup>Opportunities for learning to improve health literacy, individual capacity, and community capacity to act to improve and protect their health.<sup>17</sup>

<sup>b</sup>Only in the preschool setting.

<sup>c</sup>Actions in partnership with individuals or social groups to mobilize social and material resources for health.<sup>17</sup>

<sup>d</sup>Action taken on behalf of individuals/communities to overcome structural barriers to the achievement of health.<sup>17</sup>

health of preschool children. KGFYL is an award-based program implemented in early childhood settings and primary schools. The program operates within a health-promoting schools framework to reduce the risk of childhood obesity by creating environments that promote healthy eating and physical activity.<sup>23</sup> To avoid overwhelming preschool teachers, a formal partnership of these early childhood health-promotion projects was established. An integrated package was subsequently developed that delivered the intervention strategies, collected the evaluation data for the three individual programs, and was respectful of the capacity of the preschool teachers to undertake all that was required. A training program was also developed for allied and dental health professionals to become the “interventionists” and deliver the intervention. The training program provided training in children’s nutrition, oral health, and active play and delivering health promotion in the early childhood sector. These interventionists then supported intervention implementation in individual preschools by providing resources for preschool teachers, facilitating linkages with community organizations, collecting evaluation data, and providing ongoing support (via

email, phone, and one-on-one meetings). Although delivering this integrated health-promotion package was a positive outcome and critical to the successful implementation of the intervention in the preschool setting, this was a significant limitation for the evaluation because it became virtually impossible to maintain the integrity of the *Romp & Chomp* program components and be able to attribute impacts and outcomes solely to this one program. This provides a useful example of the difficulties in balancing evaluation rigour with real world implementation practicalities and context.

### *Evaluation Design*

The *Romp & Chomp* evaluation was cross-sectional and quasi-experimental, with measures taken at baseline and follow-up in the intervention area and at follow-up in a comparison group drawn from Local Government Areas (LGAs) across other parts of Victoria. The analysis of the outcome and impact measures (anthropometry, weight status, and children’s nutrition and activity related behaviors)<sup>14</sup> and changes in the family day care setting have been reported elsewhere.<sup>24</sup>



### Participants

Participants for this study were the directors of the LDC centers and the teachers of the 4-year-old groups in the preschools. In the intervention area, all LDC centers ( $n = 29$ ) and preschools ( $n = 50$ ) were invited to participate. The comparison samples were purposively selected to provide LGAs matched to the intervention LGAs on a range of population demographic variables (including age and gender profile, community ethnic diversity, population size, and community level of disadvantage), as well as the types and scale of health-promotion programs being undertaken in the LGAs at the time of sampling. In 2007–2008 (follow-up), directors of all LDC centers and preschools in the intervention area and 33 (of 79) selected comparison LGAs were invited to participate in the evaluation (Table 2).

### LDC and Preschool Environmental Audits

The environmental audits were adapted specifically for *Romp & Chomp* from previously used environmental surveys and based on the Analysis Grid for Environments Linked to Obesity (ANGELO) framework.<sup>25</sup> The LDC and preschool audits were completed by LDC and preschool directors/teachers, comprised 50–60 items, and captured the general characteristics of the settings and aspects of the physical, policy, sociocultural, and economic environments of the setting that related to eating and activity. A similar audit was used for evaluation of environmental changes in the family day care.<sup>24</sup>

### Policy Analysis

The contents of policies related to children's nutrition and physical activity were examined using a policy checklist.<sup>26</sup> The items in the two-page checklist are based on recognized health-promoting policy content for early childhood services<sup>26</sup> and included: Restrictions on provi-

sion of sugar-sweetened beverages, restrictions on provision of unhealthy food items, having set minimum times children spent outside each day, requirements for professional development in children's nutrition and/or physical activity for staff, and restrictions on use of screen-based entertainment for children. The total number of elements present in each of the policies analyzed were summed for analysis. For example, if a policy had 7 of the 20 elements examined, then the policy score derived was 7, with a higher score indicating a policy containing more elements hypothesized to promote children's healthy eating and physical activity. Nutrition and physical activity policies were examined separately.

### Socioeconomic Status

Area-level socioeconomic status was determined using the Socio-Economic Indexes For Areas (SEIFA) score on the index of relative socioeconomic disadvantage from the 2006 Australian Census data<sup>27</sup> based on the postcode of the LDC center or preschool. The index incorporates variables such as income, education, occupation, living conditions, access to services, and wealth. A lower score on the index indicates that an area is more disadvantaged.

### Study Approval

This study was approved by the Deakin University Human Research Ethics Committee, the Department of Human Services, and the Department of Education & Early Childhood Development. The trial registration is ACTRN12607000374460.

### Data Treatment and Statistical Tests

A number of composite measures were derived (Table 3) and multivariate (MV) regression analysis was performed (linear and binary logistic), adjusting for clus-

**Table 2. Characteristics of the Long Day Care Centers and Preschools in the Intervention and Comparison Groups**

Long Day Care (LDC) services	Intervention	Comparison
Number of LDC services in the local government areas selected	29	469 <sup>a</sup>
Number of LDC directors surveyed	10	161
SEIFA <sup>b</sup> percentile (mean, 95% CI)	22.8 (2.43, 43.17)	49.81 (45.74, 53.87) <sup>c</sup>
Average number of children attending center each week (mean, 95% CI)	120.70 (65.35, 176.05)	98.68 (90.13, 107.24)
Center provides meals and snacks (%)	90.0	95.2
Preschools	Intervention	Comparison
Number of preschools	50	566
Number of preschool directors surveyed	41	347
SEIFA <sup>b</sup> percentile (mean, 95% CI)	51.24 (42.66, 59.83)	46.23 (43.40, 49.06)
Total 4-year-old children attending each week (mean, 95% CI)	44.02 (39.09, 48.96)	45.76 (43.09, 48.43)

<sup>a</sup>Of these, 185 were privately owned by one for-profit company, which banned the directors from participating in the research. If we exclude this group from the comparison sample, the response rate is 57% (161/284).

<sup>b</sup>SEIFA, Socio-Economic Indexes For Areas (index of relative disadvantage); an indicator of area-level disadvantage using postcode, based on Census data for that area.<sup>27</sup> More disadvantaged areas have lower percentiles.

<sup>c</sup> $p = 0.02$ .

**Table 3. Derivation of Composite Indicators for Analysis**

Composite measure	Type of data	Variables used
Food-related physical environment	Staff ratings from 0 to 10	Rating of food preparation areas, food storage areas, food serving areas
Physical activity-related physical environment	Staff ratings from 0 to 10	Rating of outdoor space, outdoor equipment, outdoor shade, indoor space, indoor equipment.
Staff confidence	Staff ratings from 0 to 10	Level of confidence of running activities to develop fundamental movement skills, answer questions about healthy eating, encourage parents to supply healthy foods
Food-related practices that staff performed	Incidence of practice (present = 1, not present = 0)	Staff sits with children while they eat “always” or “most of the time”; staff eats and drinks the same things as children “always” or “most of the time”; staff talks to children about healthy foods “always” or “most of the time”; staff gives information to parents about healthy eating “once a week or more”
Number of different types of equipment available for children outdoors	Incidence (present = 1, not present = 0)	Climbing equipment; equipment that can be moved by children; equipment that can be rearranged by care providers; additional outdoor play equipment
Rules about foods provided to children in care	Incidence of rules and guidelines (present = 1, not present = 0)	Guidelines are provided about bringing healthy food; healthy food guidelines are written; allowing healthy (milk, water, fruit, vegetables) products; not allowing less healthy (packaged snacks, cordial, juice, soft drink) products
Number of communication strategies utilized by care providers to promote nutrition and physical activity	Incidence of strategy (present = 1, not present = 0)	Conversations with parents, individual written notes, communication books, bulletin boards, temporary visual displays, newsletters, brochures, tip sheets, parent–care provider agreements, other methods
Support from parents, staff, and management	Staff ratings from 0 to 10	The level of support from parents for promoting children’s healthy eating; the level of support from staff for promoting children’s healthy eating; the level of support from management for promoting children’s healthy eating

**Table 4. Long Day Care Centers: Crude Means and Adjusted Differences in the Physical Activity and Nutrition-Related Environments between Intervention and Comparison Groups**

Physical activity/active play	Intervention mean (95% CI)	Comparison mean (95% CI)	Coefficient <sup>a</sup> (95% CI)
<i>Ratings of resources, infrastructure and confidence</i>			
<b>Rating of the physical activity (indoor and outdoor) physical environment (mean rating)</b>	<b>9.04 (8.23, 9.85)</b>	<b>8.55 (8.39, 8.72)</b>	<b>0.48 (0.25, 0.70)<sup>b</sup></b>
<i>Children’s active and sedentary behaviors</i>			
<b>Time children spend in organized active play last session (minutes)</b>	<b>153.33 (43.08, 263.59)</b>	<b>184.56 (161.99, 207.12)</b>	<b>-28.42 (-54.93, -1.92)<sup>c</sup></b>
<b>Time children spend in quiet sitting activities last session (minutes)</b>	<b>90.00 (45.54, 134.46)</b>	<b>153.08 (136.60, 169.567)</b>	<b>-68.23 (-90.07, -46.38)<sup>b</sup></b>
<b>Time children spend watching television, DVDs, or videos at setting (hours/week)</b>	<b>0.10 (-0.13, 0.33)</b>	<b>0.70 (0.43, 0.97)</b>	<b>-0.56 (-0.81, -0.32)<sup>b</sup></b>
<i>Training and Practices</i>			
<b>Service has a set minimum time for outside play (% yes)</b>	<b>40.00 (7.76, 72.23)</b>	<b>26.71 (19.980, 33.61)</b>	<b>1.71 (1.20, 2.43)<sup>b,d</sup></b>
<b>A set minimum time for organized active play (% yes)</b>	<b>40.00 (7.76, 72.23)</b>	<b>24.84 (18.10, 31.59)</b>	<b>2.02 (1.40, 2.91)<sup>b,d</sup></b>
Staff trained about child physical activity (number of staff)	7.00 (-2.42, 16.42)	5.10 (4.36, 5.84)	0.73(-0.33, 1.78)
Strategies to communicate with parents about physical activity (number of strategies)	8.80 (7.88, 9.72)	8.26 (7.92, 8.60)	0.17 (-0.31, 0.65)
Rated availability of resources about physical activity <sup>e</sup>	7.50 (6.00, 9.00)	7.41 (7.07, 7.76)	0.15 (-0.37, 0.66)
<b>Nutrition/healthy eating</b>			
<i>Ratings of resources, support and confidence</i>			
<b>Rated availability of resources about nutrition (mean rating)<sup>e</sup></b>	<b>8.79 (7.88, 9.70)</b>	<b>8.11 (7.83, 8.40)</b>	<b>0.46 (0.03, 0.89)<sup>c</sup></b>
<b>Rating of the physical food environment (mean rating)<sup>e</sup></b>	<b>9.29 (8.71, 9.87)</b>	<b>8.79 (8.54, 9.04)</b>	<b>0.48 (0.25, 0.70)<sup>b</sup></b>
<b>Support from parents, staff, and management for healthy eating (rating)<sup>e</sup></b>	<b>9.18 (8.64, 9.73)</b>	<b>8.87 (8.69, 9.06)</b>	<b>0.63 (0.48, 0.78)<sup>b</sup></b>
<b>Rated confidence running activities to support healthy eating and physical activity<sup>e</sup></b>	<b>8.08 (6.59, 9.57)</b>	<b>8.20 (7.97, 8.43)</b>	<b>-0.24 (-0.48, -0.00)<sup>c</sup></b>

Continued on page 210

tering by LGA, number of children enrolled, and the socioeconomic status of the preschool, in preschool models, as well as for the number of children cared for, total number of children centers licensed to care for, operating hours/day, and socioeconomic status of the center in LDC models. Analyses were conducted using Stata SE 10.1, and  $p < 0.05$  was considered statistically significant.

## Results

### Long Day Care

Table 2 shows the response rates and characteristics of the participating LDC services and preschools and characteristics of the LDC centers involved in the evaluation. An overall response rate of 34% was achieved; however, during data collection it became known to researchers that the major private-for-profit LDC provider in the State had prevented its staff from completing the audit. When these LDC centers ( $n = 185$ ) were excluded from the comparison sample size, the response rate was 57%. This difficulty of the for-profit LDC centers protecting their “corporate” data became an unanticipated limitation on the evaluation

design and resulted in a comparison sample that was only representative of the public (not-for-profit) sector.

Table 4 shows that at follow-up in the intervention group, the physical environment was rated higher and children reportedly spent less time in screen-based sedentary behaviors, quiet sitting activities, and organized active play. Intervention LDC centers were more likely to have an active play policy and contained more elements to promote children’s physical activity. Table 4 also shows that at follow-up intervention LDC centers gave higher ratings to the availability of resources about nutrition, had more staff trained about nutrition, and lower reports of children being rewarded or comforted with food. Although virtually all LDC centers reported having a written nutrition/food policy, there were significantly more policy elements promoting healthy eating in the intervention group policies. The intervention LDC centers had higher ratings for the food-related physical environment and support for healthy eating and were less likely to use fundraisers involving chocolates; however, they had lower ratings of confidence, lower frequency of providing healthy food and drinks, and less likely to have healthy foods at celebrations than the comparison group.

**Table 4. Long Day Care Centers: Crude Means and Adjusted Differences in the Physical Activity and Nutrition-Related Environments between Intervention and Comparison Groups** *continued*

	Intervention mean (95% CI)	Comparison mean (95% CI)	Coefficient <sup>a</sup> (95% CI)
<i>Training and Practices</i>			
<b>Staff trained about child nutrition (number of staff)</b>	<b>11.33 (–1.46, 24.13)</b>	<b>4.77 (4.12, 5.42)</b>	<b>4.18 (1.45, 6.92)<sup>f</sup></b>
Good food-related practices by care providers (number of practices)	3.80 (3.50, 4.10)	3.83 (3.77, 3.90)	–0.03 (–0.13, 0.07)
<b>Rewarding or comforting children with food (times/week)</b>	<b>0.00 (0.00, 0.00)</b>	<b>0.16 (0.07, 0.26)</b>	<b>–0.14 (–0.23, –0.06)<sup>b</sup></b>
Frequency unhealthy food and drinks provided (times/day)	0.30 (–0.05, 0.65)	0.41 (0.30, 0.52)	–0.08 (–0.24, 0.08)
<b>Frequency healthy food and drinks provided (times/day)</b>	<b>8.60 (5.88, 11.32)</b>	<b>10.41 (9.83, 10.99)</b>	<b>–1.96 (–2.84, –1.07)<sup>b</sup></b>
<b>Strategies to communicate with parents about nutrition (number of strategies)</b>	<b>8.20 (6.85, 9.55)</b>	<b>8.90 (8.68, 9.13)</b>	<b>–0.86 (–1.22, –0.50)<sup>b</sup></b>
<b>Most food at celebrations is healthy “always” or “most of the time” (% yes)</b>	<b>30.00 (–0.15, 60.15)</b>	<b>59.01 (51.3, 66.68)</b>	<b>0.30 (0.21, 0.42)<sup>b,d</sup></b>
<b>Fundraising involving chocolate in past 12 months (% yes)</b>	<b>30.00 (–0.15, 60.15)</b>	<b>38.51 (30.92, 46.10)</b>	<b>0.67 (0.50, 0.91)<sup>d,f</sup></b>
<b>Participating in KGFYL health promotion program (% yes)</b>	<b>50.00 (17.10, 82.90)</b>	<b>31.06 (23.83, 38.28)</b>	<b>2.48 (1.47, 4.18)<sup>b,d</sup></b>
<b>Policy</b>			
Service has a written food or nutrition policy (% yes)	100 (100, 100)	95.60 (92.38, 98.82)	0.02 (–0.01, 0.06)
Rules related to healthy foods (number of rules operating)	1.30 (0.95, 1.65)	1.16 (1.08, 1.24)	0.03 (–0.10, 0.16)
<b>Nutrition policy elements (number of elements present in policies)<sup>g</sup></b>	<b>7.90 (4.42, 11.38)</b>	<b>4.70 (3.92, 5.47)</b>	<b>2.25 (0.27, 4.22)<sup>c</sup></b>
<b>Service has an active play policy (% yes)</b>	<b>20.0 (6.4, 46.4)</b>	<b>12.06 (6.57, 17.54)</b>	<b>1.82 (1.15, 2.89)<sup>d,f</sup></b>
<b>Physical activity policy elements (number of elements present in policies)<sup>h</sup></b>	<b>2.20 (–0.34, 4.74)</b>	<b>0.26 (0.06, 0.52)</b>	<b>1.82 (1.51, 2.13)<sup>b</sup></b>

Variables in bold are significantly different; those that were significantly different in the anticipated direction are in bold and italicized.

<sup>a</sup>Regression analysis adjusted total number of children being cared for, total number of children center licensed to care for, the number of hours/day the center operates, and the socioeconomic status of the center. <sup>b</sup> $p < 0.001$ . <sup>c</sup> $p < 0.05$ . <sup>d</sup>Odds ratio (reference: comparison). <sup>e</sup>Rating ranges from 0 to 10 indicated on a visual analog scale (0 = very poor/not confident at all, 10 = very good/very confident);  $N$  varies from 152 to 190. <sup>f</sup> $p < 0.01$ . <sup>g</sup>Written nutrition policy was provided by 9/10 (90.0%) and 95/161 (59.0%), respectively, of the intervention and comparison directors surveyed. <sup>h</sup>Written physical activity policy was provided by 3/10 (30.0%) and 12/161 (7.5%), respectively, of the intervention and comparison directors surveyed.

CI, Confidence interval; KGFYL, Kids—‘Go For Your Life.’



*Preschools*

Table 2 shows the characteristics and response rates (intervention, 82%; comparison, 61%) of the participating

preschools. Table 5 shows that at follow-up intervention preschools had higher ratings for resources about physical activity and confidence to conduct activities to promote

**Table 5. Preschools: Crude Means and Adjusted Differences in the Physical Activity and Nutrition-Related Practices and Environments between Intervention and Comparison Groups**

Physical activity	Intervention mean (95% CI)	Comparison mean (95% CI)	Coefficient <sup>a</sup> (95% CI)
<b><i>Rated availability of resources about physical activity<sup>b</sup></i></b>	<b>8.29 (7.65–8.92)</b>	<b>6.78 (6.53–7.04)</b>	<b>1.54 (1.19, 1.90)<sup>c</sup></b>
<b><i>Rated confidence running activities to support healthy eating and physical activity<sup>b</sup></i></b>	<b>8.73 (8.27, 9.19)</b>	<b>8.17 (8.01, 8.33)</b>	<b>0.58 (0.37, 0.78)<sup>c</sup></b>
Rating of physical activity (indoor and outdoor) physical environment <sup>b</sup>	8.43 (8.01, 8.86)	8.28 (8.14, 8.42)	0.12 (–0.08, 0.33)
Strategies staff use to communicate with parents about physical activity (number of strategies)	7.05 (6.37–7.73)	6.94 (6.69–7.18)	0.10 (–0.18, 0.39)
<b><i>Preschool has a set minimum time for organized active play (% yes)</i></b>	<b>41.4 (26.1, 56.8)</b>	<b>34.6 (29.6, 39.6)</b>	<b>1.40 (1.14, 1.73)<sup>c,d</sup></b>
<b><i>Preschool has a set minimum time for outside play (% yes)</i></b>	<b>48.8 (33.2, 64.3)</b>	<b>33.4 (28.4, 38.5)</b>	<b>1.90 (1.50, 2.41)<sup>c,d</sup></b>
<b><i>Time children spend watching television, DVDs, or videos at setting (hours/week)</i></b>	<b>0.51 (–0.50–1.52)</b>	<b>0.19 (0.02–0.36)</b>	<b>0.31 (0.06–0.55)<sup>e</sup></b>
<b><i>Time spent in free inside play last session (minutes)</i></b>	<b>90.49 (75.68, 105.30)</b>	<b>105.22 (99.61, 110.83)</b>	<b>–9.39 (–15.40, –3.38)<sup>f</sup></b>
Time spent in free outside play last session (minutes)	91.95 (79.14, 104.76)	91.61 (86.41, 96.81)	3.86 (–1.80, 9.51)
<b><i>Time spent in organized active play last session (minutes)</i></b>	<b>38.90 (29.43, 48.37)</b>	<b>53.97 (48.13, 59.81)</b>	<b>–11.26 (–16.06, –6.46)<sup>c</sup></b>
<b>Nutrition/healthy eating</b>			
<b><i>Rated effectiveness of strategies at influencing parents and food sent to care<sup>b</sup></i></b>	<b>7.40 (6.62–8.19)</b>	<b>6.55 (6.29–6.81)</b>	<b>0.86 (0.54, 1.18)<sup>c</sup></b>
<b><i>Rated support from parents, staff, and management for healthy eating (rating)<sup>b</sup></i></b>	<b>8.69 (8.25, 9.13)</b>	<b>8.06 (7.91, 8.21)</b>	<b>0.63 (0.48, 0.78)<sup>c</sup></b>
<b><i>Rated availability of resources about nutrition<sup>b</sup></i></b>	<b>8.42 (7.80–9.04)</b>	<b>6.96 (6.72–7.21)</b>	<b>1.51 (1.17, 1.85)<sup>c</sup></b>
Strategies used to communicate with parents about nutrition (number of strategies)	7.59 (6.96–8.21)	7.44 (7.26–7.62)	0.17 (–0.07, 0.42)
<b><i>Allow healthy items for snack and lunch (milk, water, fruit, veggies)(yes = 1 for each)</i></b>	<b>3.59 (3.43, 3.74)</b>	<b>3.52 (3.44, 3.59)</b>	<b>0.11 (0.00, 0.21)<sup>e</sup></b>
<b><i>Allow unhealthy items for snack and lunch (packet snacks, cordial, juice, soft drink) (yes = 1 for each)</i></b>	<b>0.34 (0.11, 0.57)</b>	<b>1.50 (1.37, 1.62)</b>	<b>–1.16 (–1.33, –0.99)<sup>c</sup></b>
<b><i>Positive food-related practices by care providers (number)</i></b>	<b>3.61 (3.38, 3.84)</b>	<b>3.52 (3.44, 3.60)</b>	<b>0.13 (0.02, 0.23)<sup>e</sup></b>
<b><i>Fundraising involving chocolate in the past 12 months (% yes)</i></b>	<b>46.3 (3.1, 6.2)</b>	<b>59.1 (53.9, 64.3)</b>	<b>0.58 (0.43–0.78)<sup>c,d</sup></b>
<b><i>The majority of food at celebrations is healthy always/most of the time (% yes)</i></b>	<b>29.3 (15.1, 43.4)</b>	<b>22.4 (18.1, 26.9)</b>	<b>1.55 (1.04–2.32)<sup>d,e</sup></b>
<b><i>Participate in the KGFYL health promotion program (% yes)</i></b>	<b>75.6 (62.3, 89.0)</b>	<b>26.5 (21.8, 31.2)</b>	<b>9.67 (5.18, 18.06)<sup>c</sup></b>
<b>Policy</b>			
<b><i>Rules related to healthy foods (number of rules operating)</i></b>	<b>2.46 (2.23, 2.70)</b>	<b>1.96 (1.87, 2.04)</b>	<b>0.52 (0.41, 0.6)<sup>c</sup></b>
<b><i>Preschool has a written healthy eating policy (% yes)</i></b>	<b>87.8 (77.6, 98.0)</b>	<b>65.0 (59.9, 70.1)</b>	<b>4.57 (3.50, 5.97)<sup>c,d</sup></b>
<b><i>Nutrition policy elements (number of elements present in policies)<sup>g</sup></i></b>	<b>7.66 (5.09, 10.23)</b>	<b>3.13 (2.69, 3.56)</b>	<b>4.71 (4.18, 5.24)<sup>c</sup></b>
<b><i>Preschool has an Active Play policy (% yes)</i></b>	<b>9.21 (2.64, 15.8)</b>	<b>3.37 (1.43, 5.32)</b>	<b>7.39 (3.50, 15.58)<sup>c,d</sup></b>
<b><i>Physical activity policy elements (number of elements present in policies)<sup>h</sup></i></b>	<b>2.07 (0.89, 3.25)</b>	<b>0.22 (0.09, 0.34)</b>	<b>1.90 (1.75, 2.05)<sup>c</sup></b>

Variables in bold are significantly different; those that were significantly different in the anticipated direction are in bold and italicised.

<sup>a</sup>Regression analysis adjusted for total number of children enrolled and the socioeconomic status of the preschool. <sup>b</sup>Rating ranges from 0 to 10 indicated on a visual analog scale (0 = very poor/not confident at all/very ineffective; 10 = very good/very confident/very effective). <sup>c</sup> $p < 0.001$ . <sup>d</sup>Odds ratio (reference: comparison). <sup>e</sup> $p < 0.05$ . <sup>f</sup> $p \leq 0.01$ . <sup>g</sup>Written nutrition policy was provided by 24/41 (58.5%) and 157/347 (45.2%), respectively, of the intervention and comparison directors surveyed. <sup>h</sup>Written physical activity policy was provided by 12/41 (29.5%) and 26/347 (7.5%), respectively, of the intervention and comparison directors surveyed.

CI, Confidence interval; KGFYL, Kids—'Go For Your Life.'

physical activity and healthy eating. However, children in the intervention group watched more television and videos and spent less time in organized active play and free inside play. Intervention preschools were more likely to have an active play policy that contained more elements related to physical activity and were more likely to set a minimum time for organized active play and outside play.

Table 5 also shows that intervention preschools reported having more support and resources for promoting children's healthy eating at follow-up. Intervention preschools more frequently allowed healthy items, had rules related to parent's providing healthy foods, staff with positive food-related practices, and allowed unhealthy items less frequently than comparison preschools. Intervention preschools were also more likely to have a healthy eating policy, with more nutrition policy elements, to be involved in other health-promotion programs (KGFYL), have healthier foods at celebrations, and less likely to use fundraisers involving chocolate than comparison preschools.

## Discussion

Although this evaluation has shown mixed results, a variety of aspects of the environments and practices examined were more health-promoting in the intervention early childhood settings at follow-up, suggesting that *Romp & Chomp* achieved some of its anticipated impacts. The results also highlight the importance of understanding the different contexts in different early childhood settings, with more positive results observed in relation to healthy eating, and in the preschool setting. *Romp & Chomp* was not a set intervention program operating uniformly across the various settings, and the differences in the impact of the intervention between settings may relate to differences in the intensity and nature of implementation (with more intervention activities and a higher level of support for implementation in the preschool setting), as well as the nature of the settings themselves (including staff qualifications, types of facilities, and the services provided). This is only apparent through process evaluation, which provides an in-depth understanding of the contextual factors operating when implementing complex interventions and allows evaluators to examine the relationship of these contextual factors with the observed impacts, providing critical information for enhancing the implementation of future public health initiatives.

### *The LDC Setting*

Children may spend a substantial proportion of their day and their week in the LDC setting from a very young age; therefore, even small improvements can have a substantial impact. The intervention activities in LDC focused on reinforcement of existing good practices, reviewing existing nutrition policies and practices, and providing resources for children, staff and parents. A variety of

indicators demonstrate positive differences between the intervention and comparison groups, including better policies and fewer unhealthy practices (such as rewarding or comforting children with food and fundraisers involving unhealthy foods). However, certain practices continue to be of concern in this setting, including frequently providing unhealthy celebration foods and low levels of communication with parents promoting healthy eating. Surprisingly, we also found that at follow-up healthy items were served to children less frequently in intervention LDC centers than comparison centers. The process evaluation revealed that intervention LDC centers moved away from serving water to children at meal and snack times and instead provided children with access to water fountains and their own drink bottles continuously throughout the day. Analysis revealed that the lower frequency of serving water to children explained the majority of the difference between intervention and comparison centers in the provision of healthy items, suggesting successful adoption of the key message related to drinking water in the intervention centers. This is an example of the importance of interpreting the intervention impacts in relation to the process evaluation and carefully considering how the intervention strategies were implemented under varying contexts.

A large component of the intervention was directed toward increasing children's physical activity while in care and enhancing the development of their fundamental movement skills. The pilot study of the Active Play Program implemented showed this program to effectively improve children's fundamental movement skills.<sup>28</sup> The *Romp & Chomp* evaluation in LDC showed that on a variety of indicators positive changes were made in intervention centers to promote children's opportunities for physical activity (e.g., set minimum times, more staff trained, and less involvement in sedentary, screen-based activities). These factors have been highlighted in a recent review as critical influences on young children's physical activity.<sup>9</sup> The finding that children spent less time in organized active play in the intervention centers is, however, the opposite of what was intended and points to the involvement of undetermined barriers to developing children's fundamental movement skills while in care that go beyond the anticipated barriers of equipment, resources, and training. This is an important finding for those considering implementing physical activity interventions in the LDC setting in the future.

Despite staff perceiving high levels of support to promote healthy eating and physical activity, having resources available, and supportive physical environments, we also found lower staff confidence to promote healthy eating and physical activity in intervention LDC centers. We recommend a variety of ongoing capacity-building activities to increase and sustain the confidence of care providers to promote healthy eating, develop children's fundamental movement skills, and engage with parents about promoting children's health. Although both the

nutrition and physical activity policies were more comprehensive in the intervention group, the policies tended to contain only a limited number of elements and could certainly be strengthened to provide better support for staff to promote children's healthy eating and activity.

### *The Preschool Setting*

In Australian preschools, children bring their snack and lunch foods and drinks from home. A focus of the intervention was to provide teachers with support to develop and implement policies and enhance related skills and confidence. Important positive differences between intervention and comparison preschools were found at follow-up. In relation to healthy eating, positive differences were observed in policy implementation, parent communication, staff practices, and enforcing rules related to children's foods and drinks.

There were also positive differences in the physical, policy, and sociocultural aspects of the preschool environment related to physical activity, although the results were modest and more varied. Intervention preschools were more likely to have an active play policy, better resources, and a set minimum time for organized active play—factors previously associated with higher levels of physical activity and reduced sedentary behaviors.<sup>29–33</sup> However, children in the intervention preschools were engaged in about 20 minutes more screen time and spent about 20 minutes less in organized active play and free inside play each preschool session than those in the comparison group. Although teachers reported higher levels of confidence in relation to physical activity, this does not seem to have positively influenced children's activity levels in this setting. Therefore, there appears to be an opportunity to increase children's time being physically active by reducing their time in screen-based activities during the preschool session. The barriers to increasing children's activity levels in early childhood settings remain unclear, although it is possible that within the intervention timeframe, intervention preschools chose to focus on promoting children's nutrition rather than physical activity. This is an important consideration for those planning multistrategy interventions in early childhood settings.

On balance, it appears that the intervention was more successful at improving the nutrition environment in the preschool setting, although we did not perform a comparative study between the types of settings. As discussed throughout, the process evaluation suggests that these differences may relate to differences in the implementation of the intervention between the settings, or the context into which the intervention was delivered. In the preschool setting, more intervention activities were implemented and a higher level of support was provided. In addition, compared to staff in a LDC setting, preschool teachers have postsecondary qualifications, are more accustomed to being involved in external programs, and have greater opportunities for professional development. These contextual considerations cannot be overlooked

in relation to planning for successful intervention implementation.

We have previously shown that *Romp & Chomp* reduced the prevalence of childhood obesity in the intervention area.<sup>14</sup> Although the impacts described in early childhood settings are modest, they have the potential to impact all children in the settings (about 5000 children in the preschools and LDC alone). These impacts and the process evaluation suggest that the success of *Romp & Chomp* may be at least partly attributable to improved early childhood settings and a consistency of messages, policies, and capacity building across the intervention community.

### *Limitations*

As discussed throughout, the difficulties encountered with testing a complex community-based intervention impacted on the rigor of the evaluation designed and completed. The intervention delivered was an integrated program of health-promotion activities, bringing together three large-scale programs. It was not possible to disentangle the influences of each intervention program, and this limited our ability to attribute the differences solely to *Romp & Chomp*. The evaluation design was also limited, and compared follow-up data only as baseline data were not available in the comparison group. This limited our ability to assess changes over time or determine how balanced the samples were on the measures prior to the intervention. Other limitations include the low response rate from LDC centers, the self-report nature of most of the data (which may introduce social desirability and recall bias), and the lack of direct measurement of children's physical activity and eating while in the setting, which may have provided more sensitive data to determine effectiveness. The balance between successful implementation of the intervention program community wide, feasibility of collecting the evaluation data, and the rigor required for strong, scientific evaluations with valid, sensitive and objective evaluation measures will continue to be a challenge for those undertaking complex settings-based community-wide public health interventions.

The *Romp & Chomp* intervention funding was a total of \$AUD 100,000. This funding was primarily used to employ a project officer. The personnel in the project officer position varied over the 4 years of planning and implementation; however, all were either community dietitians or health-promotion managers. Given this low level of funding, through stakeholder engagement and negotiation, additional staff resources for supporting implementation were acquired from community health (including dental health) services, making use of the allocated health-promotion hours funded by government for allied health professionals (0.2 FTE), good will, and shared public health priorities.<sup>14</sup> For those interested in implementing a similar intervention program, detailed process evaluation reports and the resources and *Romp &*



*Chomp* intervention materials are all freely available on the internet at [www.goforyourlife.vic.gov.au/hav/articles.nsf/practitioners/Romp\\_and\\_Chomp\\_Process\\_Reports](http://www.goforyourlife.vic.gov.au/hav/articles.nsf/practitioners/Romp_and_Chomp_Process_Reports).

On the basis of the findings from this study and our previous findings,<sup>14,24,34</sup> we have identified the key intervention components that may be transferable to other communities and countries:

- Stakeholder engagement in the development and implementation of the intervention strategies, including representation across the following sectors—health, education, government, nongovernment, family services, and children’s services.
- Capacity building of early childhood educators and care providers. This includes professional development in nutrition, physical activity, health-promotion, policy development and implementation, and parent engagement.
- Initial professional development, training and resources, accompanied by ongoing support (coaching) onsite and via a phone/email interface by health-promotion and allied health professionals.
- Professional development for health professionals to provide this support role, with this training linked to continuing professional development (CPD) and/or organizational training opportunities, and completed courses credited through annual performance reviews, professional degrees, and other training opportunities (e.g., diplomas) for most sustainable options.
- Policy and guideline implementation in relation to foods provided and allowed in early childhood settings and promoting opportunities for children to be physically active, develop fundamental movement skills, and limit screen-based activities.
- Social marketing and parent engagement strategies to engender support of parents and across the community.
- Parent education materials and resources disseminated through early childhood settings and children’s services (e.g., child health services, children’s settings, and community health) to inform parental decision making and promote healthy choices.

In addition to these core elements, when the intervention is implemented in communities or settings that have additional barriers, such as those related to poverty, geography, language, culture, social isolation, and difficult family circumstances, more support will be required for the staff in these settings and with social marketing, resources and parent engagement strategies to increase the likelihood of successful implementation.

## Conclusion

Improvements made in LDC and particularly the preschool settings through the *Romp & Chomp* intervention appear to have created more opportunities for children’s healthy eating and potentially physical activity. The factors for success for settings-based, environmentally

focused obesity prevention interventions relate to ongoing capacity-building activities for staff, fostering support for policy implementation and redevelopment, and parent engagement. In addition, recognition by funders and reviewers of the difficulties involved in implementing and evaluating such complex interventions is also critical to ensure that the evidence base on the effectiveness of such public health approaches can continue to be strengthened.

## Acknowledgments

We would like to thank all members of the intervention communities for their support of the intervention activities and participants in the intervention and comparison areas for their involvement in data collection. Specific people involved in the implementation of *Romp & Chomp* were the project co-ordinators Kathleen Doole, Janet Torode, Louise van Herwerden and Mark Brennan, and additionally Janet Park, Brooke Connolly, Maree Crellin, Debbie Elea, Amanda Stirrat, Suzy Honisett, Vanessa Williams, Frank Giggins, Hilary Hoevenaars, Susan Parker, Helen Walsh, and all reference group members. We also acknowledge the time taken for state and local government staff, early childhood workers, allied health professionals, and dental staff to participate in implementation and data collection. In addition, we are grateful for the contribution of Deakin University evaluation staff and students from 2005 to 2009, particularly Karen Stagnitti, Anne Simmons, Narelle Robertson, Florentine de Groot, and Cheryl-Ann Bennett.

Funding was received from the Department of Human Services, the Department of Education and Early Childhood Development, City of Greater Geelong, Barwon Health, Deakin University, Leisure Networks, and the Commonwealth Department of Health and Ageing. In addition, A. Colin Bell and Andrea de Silva-Sanigorski were supported by a VicHealth fellowship and Melanie Nichols was supported by an Australian Research Council Australian Postgraduate Award. Andrea de Silva-Sanigorski was also supported by the Jack Brockhoff Foundation and an NHMRC Capacity Building Grant for Obesity Prevention. Substantial in-kind contributions and resources were also provided by these organizations and many other organizations, particularly Dental Health Services Victoria and *Kids—‘Go For Your Life.’*

## Author Disclosure Statement

The authors declare no conflict of interest.

Boyd Swinburn, A. Colin Bell, Andrea de Silva-Sanigorski, Melanie Nichols, and Peter Kremer designed the study; Melanie Nichols, Lauren Carpenter, Sharon Sharp, Lisa Demajo, Janet Park, and Michael Smith assisted with data collection and analysis; Andrea de Silva-Sanigorski and Peter Kremer completed the data analysis and all authors assisted with interpretation of results; Andrea de Silva-Sanigorski and Rachel Boak drafted the initial manuscript and all authors critically reviewed, finalized, and approved the manuscript.

## References

1. Birch L, Ventura A. Preventing childhood obesity: What works? *Int J Obes (Lond)* 2009;33:S74–S81.
2. Bluford D, Sherry B, Scanlon K. Interventions to prevent or treat obesity in preschool children: A review of evaluated programs. *Obesity* 2007;15:1356–1372.
3. Conroy S, Ellis R, Murray C, et al. An integrative review of Canadian childhood obesity prevention programmes. *Obes Rev* 2007;8:61–67.
4. Dehghan M, Akhtar-Danesh N, Merchant AT. Childhood obesity, prevalence and prevention. *Nutr J* 2005;4:24.
5. Kaphingst KM, Story M. Child care as an untapped setting for obesity prevention: State child care licensing regulations related to nutrition, physical activity, and media use for preschool-aged children in the United States. *Prev Chronic Dis* 2009;6:A11.
6. Story M, Kaphingst K, French S. The role of child care settings in obesity prevention. *Future Child* 2006;16:143–168.
7. Waters E, de Silva-Sanigorski AM, Hall BJ, et al. Interventions for preventing obesity in children. *Cochrane Database Syst Rev* 2011;12:CD001871.
8. Jaime PC, Lock K. Do school based food and nutrition policies improve diet and reduce obesity? *Prev Med* 2009;48:45–53.
9. Trost SG, Ward DS, Senso M. Effects of child care policy and environment on physical activity. *Med Sci Sports Exerc* 2010;42:520–525.
10. Mayer K. Childhood obesity prevention: Focusing on the community food environment. *Fam Community Health* 2009;32:257–270.
11. Summerbell CD, Douthwaite W, Whittaker V, et al. The association between diet and physical activity and subsequent excess weight gain and obesity assessed at 5 years of age or older: A systematic review of the epidemiological evidence. *Int J Obes (Lond)* 2009;33 (Suppl 3):S1–92.
12. Economos CD, Irish-Hauser S. Community interventions: A brief overview and their application to the obesity epidemic. *J Law Med Ethics* 2007;35:131–137.
13. Sanigorski AM, Bell AC, Kremer PJ, et al. Reducing unhealthy weight gain in children through community capacity-building: Results of a quasi-experimental intervention program, Be Active Eat Well. *Int J Obes (Lond)* 2008;32:1060–1067.
14. de Silva-Sanigorski AM, Bell AC, Kremer P, et al. Reducing obesity in early childhood: Results from Romp & Chomp, an Australian community-wide intervention program. *Am J Clin Nutr* 2010;91:831–840.
15. Bell AC, Simmons A, Sanigorski AM, et al. Preventing childhood obesity: The sentinel site for obesity prevention in Victoria, Australia. *Health Promot Int* 2008;23:328–336.
16. McLeroy K, Bibeau D, Steckler A, et al. An ecological perspective on health promotion programs. *Health Educ Q* 1988;15:351–377.
17. Nutbeam D. Evaluating health promotion—progress, problems and solutions. *Health Promot Int* 1998;13:27–44.
18. Council of Australian Governments (COAG). National Partnership Agreement on Early Childhood Education, 2009. Available at [www.coag.gov.au/intergov\\_agreements/federal\\_financial\\_relations/docs/national\\_partnership/national\\_partnership\\_on\\_early\\_childhood\\_education.pdf](http://www.coag.gov.au/intergov_agreements/federal_financial_relations/docs/national_partnership/national_partnership_on_early_childhood_education.pdf). Last accessed April 7, 2012.
19. Ewles L, Simnett I. *Promoting Health: A Practical Guide*, 5th ed. Elsevier: Bailliere Tindall, 2003.
20. Waters E, Hall BJ, Armstrong R, et al. Essential components of public health evidence reviews: Capturing intervention complexity, implementation, economics and equity. *J Public Health (Oxf)* 2011;33:462–465.
21. Stagnitti K, van Herwerden L, Sanigorski A, et al. Structured Active Play Program: A program for early childhood settings in the City of Greater Geelong. Australia: The Romp & Chomp project; 2007. Available at <http://hdl.handle.net/10536/DRO/DU:800/0525>
22. Pollard C, Lewis J, Miller M. Start right-eat right award scheme: Implementing food and nutrition policy in child care centers. *Health Educ Behav* 2001;28:320–330.
23. Honisett S, Woolcock S, Porter C, et al. Developing an award program for children's settings to support healthy eating and physical activity and reduce the risk of overweight and obesity. *BMC Public Health* 2009;9:345.
24. de Silva-Sanigorski A, Elea D, Bell C, et al. Obesity prevention in the family day care setting: Impact of the Romp & Chomp intervention on opportunities for children's physical activity and healthy eating. *Child Care Health Dev* 2011;37:385–393.
25. Swinburn B, Egger G, Raza F. Dissecting obesogenic environments: The development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Prev Med* 1999;29:563–570.
26. de Silva-Sanigorski A, Prosser L, Carpenter L, et al. Evaluation of the childhood obesity prevention program Kids—'Go for your life'. *BMC Public Health* 2010;10:288.
27. Pink B. Socio-Economic Indexes for Areas (SEIFA)—Technical Paper 2006. Australian Bureau of Statistics, Commonwealth of Australia: Canberra, 2006.
28. Stagnitti K, Malakellis M, Kershaw B, et al. Evaluating the feasibility, effectiveness and acceptability of an active play intervention for disadvantaged preschool children: A pilot study. *Australasian Journal of Early Childhood* 2011;36:66–72.
29. Hinkley T, Crawford D, Salmon J, et al. Preschool children and physical activity: A review of correlates. *Am J Prev Med* 2008;34:435–441.
30. Dowda M, Brown WH, McIver KL, et al. Policies and characteristics of the preschool environment and physical activity of young children. *Pediatrics* 2009;123:e261–e266.
31. Brown WH, Pfeiffer KA, McIver KL, et al. Social and environmental factors associated with preschoolers' nonsedentary physical activity. *Child Dev* 2009;80:45–58.
32. Cardon G, Labarque V, Smits D, et al. Promoting physical activity at the pre-school playground: The effects of providing markings and play equipment. *Prev Med* 2009;48:335–340.
33. Deal TB. Physical activity patterns of preschoolers during a developmental movement program. *Child Study J* 1993;23:115–134.
34. de Groot FP, Robertson NM, Swinburn BA, et al. Increasing community capacity to prevent childhood obesity: Challenges, lessons learned and results from the Romp & Chomp intervention. *BMC Public Health* 2010;10:522.

Address correspondence to:

Andrea M. de Silva-Sanigorski, B.Sc., M.H.N., Ph.D.  
Associate Professor  
Associate Director, Prevention Science  
and Intervention Research  
Jack Brockhoff Child Health and Wellbeing Program  
Melbourne School of Population Health  
The University of Melbourne  
Level 5, 207 Bouverie Street  
Carlton 3053, Australia

E-mail: [andreams@unimelb.edu.au](mailto:andreams@unimelb.edu.au)