ENCYCLOPEDIA on Early Childhood Development

Obesity Prevention in the Preschool Years

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Introduction and Subject

The preschool years are critically important for child health, developmental, learning and social outcomes. From about the age of two, many children spend increasing amounts of time away from their primary caregivers in early childhood settings such as day care, kindergartens, nurseries and early learning centres.[1,2] These settings, along with the family/home environment influence children's dietary intake, physical activity and in turn energy balance, and as can help promote healthy behaviours and healthy weight, and reduce the risk of developing childhood obesity.[1-3]

Recent Research Results

The results from our recent systematic review of the obesity prevention evidence[4] and studies emerging in the literature more recently, suggest that obesity prevention in the early years can be effective. The recent Cochrane systematic review[4] included controlled studies with a duration of at least 12 months, and a minimum of six clusters (if a *RCT [randomized controlled trial]*). Eight studies were included which targeted young children (0-5 years). Analysis showed that children in the intervention group had a smaller increase or a larger decrease in *body mass*

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index (BMI) from pre- to post- intervention compared to the children in the control group. Overall, the children in the intervention group had a change in BMI that was 0.26 units less than the control group. For a preschool child aged 3.7 years with a BMI of 16.3, this represents a difference in BMI of 1.6%. At a population-level this result is very encouraging, however there was a lot of variability in the studies, with some interventions based in homes, and others in education and healthcare settings. When we looked at these separately we found those that were either home-based or involved a healthcare setting[5,6] produced bigger effects then the interventions conducted in an education-setting, although the number of studies is small.

When examining the individual studies, only two studies reported significant differences in measures of *adiposity* between groups immediately post-intervention;[6,7] these were also the longest-running studies in the group. Although based on only a few studies, and not all individual studies showed significant differences, these results suggest that for children aged 0-5 years, interventions set outside education settings are possibly more effective, which may relate to a number of factors including the level of parent engagement. This finding is consistent with Hesketh and Campbell's previous review.[8] Further detailed exploration of these studies is needed to identify effective program components.[9]

Five of the eight studies incorporated both diet and physical activity intervention strategies; three were physical activity interventions only. All but one of the studies had short intervention periods (< one year; six studies ≤ 24 weeks), with only Jouret[7] having a longer intervention period (two years). Of the eight study designs, theoretical basis was explicitly reported in one10 however, we can surmise that behaviour change theory informed the design of five of the studies and environmental change models seemed to inform the design of two of the studies.[4]

On balance, quite modest behavioural impacts were achieved from the interventions in this age group. Dietary changes were reported in only two studies.[6,11] Fitzgibbon reported that the children who received interventions had a significantly lower intake of saturated fat at one-year follow-up ($P = 0.002$), but not post-intervention or at two-year follow-up.[11] When the same intervention was conducted with a Latino community these same results were not observed.[12] The intervention by Keller resulted in significantly lower energy intake and percentage protein intake in the intervention group post-intervention.[6] Of the three interventions targeting physical activity-related behaviours, the only positive impact was observed in the study by Reilly, and was specific to improved fundamental movement skills.[13]

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Other evidence

The Cochrane review includes childhood obesity prevention studies published until early 2010. Since that time other controlled trials in preschool aged children have emerged in the literature. Once such study is Romp & Chomp.[14] This was a community-wide Australian intervention with a focus on environmental determinants of childhood obesity. It targeted children aged 0-5 years and the intervention program was delivered through child care (centre-based and family-based day care), education (preschools) and health (universal child health checks) services. The outcome evaluation showed an increase in the prevalence of overweight/obesity from baseline to follow up in all the groups, but this increase was significantly lower in both the 2-year-old and 3.5-year-old intervention groups (1.8 and 2.7 percentage points lower than the comparison groups, respectively). In addition, overall dietary patterns were improved as a result of the intervention.[14] When exploring potential mediating pathways we observed that in at least one of the children's settings, family day care, there were positive improvements in the environment which significantly promoted active play and reduced screen-based sedentary activities. These included the implementation of rules and guidelines, more care provider practices supporting children's positive meal experiences, fewer unhealthy food items allowed, increased staff training in nutrition and physical activity and less unhealthy caregiver practices such as rewarding children with food.[15] When changes in the kindergarten settings were examined, similar environmental changes were demonstrated, although there was stronger parent engagement in this setting, compared to the child care setting.

Conclusion and Implications

Obesity prevention efforts in preschool children have shown promising results, although the number of studies is small and lower quality study designs limit our ability to make far-reaching recommendations. It is clear that further high-quality research is needed to enhance our knowledge of which interventions (and specific intervention components) are the most effective, cost-effective, safe and equitable for this age group, and how best to then embed them into current practice and systems so that all children benefit.

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