



Ruprecht-Karls-Universität Heidelberg
Medizinische Fakultät Mannheim
Dissertations-Kurzfassung

Shared correlates of physical activity and sedentary behavior in preschoolers: a multi-component multi-level approach

Autor: Michael Eichinger
Institut / Klinik: Public Health, Sozial- und Präventivmedizin
Doktormutter: Prof. Dr. Freia De Bock

Introduction

Childhood obesity rates have reached alarming levels in many countries and are associated with long-term adverse health effects for individuals and substantial economic costs for national health services. Primary prevention of overweight and obesity already in preschool age targeting physical activity and sedentary behavior is therefore a public health priority. Interventions focusing on physical activity or sedentary behavior, i.e. single energy balance-related behaviors, showed limited effects. However, targeting physical activity and sedentary behavior, i.e. two components, simultaneously, could improve intervention effectiveness. Moreover, effectiveness of interventions targeting determinants of physical activity and sedentary behavior at multiple levels of the socioecological model including individual and physical environmental factors might be increased. Multi-component multi-level interventions thus show potential to improve the effectiveness of programs preventing obesity in preschoolers. Shared correlates of physical activity and sedentary behavior could be promising intervention targets for innovative multi-component multi-level interventions, because modifying these factors potentially changes both activity behaviors simultaneously. In my doctoral thesis I therefore investigated shared correlates of physical activity and sedentary behavior outside of preschools in a large sample of German preschoolers.

Methods

The study is based on baseline data of two cluster randomized trials conducted between 2008 and 2009 targeting physical activity and sedentary behavior as well as healthy eating behaviors. In total, 735 preschoolers aged 3 – 6 years from 52 preschools were included in the study. Moderate-to-vigorous and total physical activity as well as sedentary behavior during weekend days (Saturday and Sunday, 7 am – 9 pm) and weekday afternoons (Monday – Friday, 1 – 9 pm) were objectively assessed. Using previously validated cut-offs, moderate-to-vigorous physical activity was measured with combined accelerometry and heart rate monitoring and total physical activity and sedentary behavior were assessed with accelerometry only. Potential correlates were investigated at the family- and community-level. Family-level data was obtained from questionnaires completed by parents during the baseline assessment of the cluster randomized trials and was linked with community-level data from routine administrative datasets. Potential correlates were identified in published systematic reviews and structured into four levels of the socioecological model: (1) demographic, (2) behavioral, (3) social, and (4) physical environmental correlates. After descriptive analyses I fitted six covariate-adjusted linear mixed models to investigate potential correlates of moderate-to-vigorous and total physical activity as well as sedentary behavior both on weekend days and weekday afternoons. In a last step, I summarized the findings of the analyses to identify shared correlates of the activity behaviors.

Results

Participation in organized sports and parental perceptions of traffic safety in the neighborhood showed associations with physical activity and sedentary behavior outcomes in four and three out of six covariate-adjusted models, respectively. Several other correlates were associated with physical activity or sedentary behavior outcomes in one or two models (e.g., season). In contrast, apart from parental leisure-time physical activity that was associated with sedentary behavior on weekend days, no other social or community-level physical environmental correlates were associated with any physical activity or sedentary behavior outcome.

Discussion

While two proximal family-level correlates, namely participation in organized sports and parental perception of traffic safety, were identified as shared correlates of physical activity and sedentary behavior, none of the more distal potential correlates such as community-level physical environmental

factors were associated with any of the outcomes. While my findings are in line with previous studies, the literature remains largely inconclusive warranting future research. The research presented in this thesis could be extended in different directions including the refinement of the existing physical activity intervention by specifically targeting participation in organized sports and parental perceptions of traffic safety or the validation of assessment methods enabling the investigation of different types of SB with potentially different health consequences (e.g., TV viewing, quiet play).

Conclusion

Participation in organized sports and parental perceptions of traffic safety, two proximal family-level correlates, were identified as shared correlates of physical activity and sedentary behavior in preschool age and might therefore be promising levers for multi-component multi-level interventions.