

Sit less, stand more: A randomized point-of-decision prompt intervention to reduce sedentary time

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Abstract:

Objective: To determine if a point-of-decision prompt (PODP) targeting sedentary behaviour influenced the proportion of standing individuals during presentations at an academic conference. **Methods:** Twelve, one-hour groups of presentation sessions (Global Summit on the Physical Activity of Children conference, May 2014) were included in this study; half were randomly assigned to the intervention group and half to the control group. The intervention group was exposed to an oral PODP at the beginning and middle of the presentations. Researchers performed three counts: beginning (e.g. first 10 min), middle (e.g. 30–40 min), and end (e.g. 50–60 min); each count included the number of individuals in the audience and the number of standing individuals. **Results:** A significantly larger proportion of individuals chose to stand during intervention group presentations ($16.9 \pm 2.0\%$) compared to control group presentations ($10.5 \pm 1.5\%$; $\chi^2 = 7.13$; $p < 0.05$). **Conclusions:** This study demonstrated the effectiveness of PODPs at decreasing sedentary behaviour during an academic conference. PODPs are simple, cost-effective interventions that require minimal time commitment, and represent a population health intervention that could reduce sedentary behaviour in a large group setting.

Keywords: Point-of-decision prompt | Sedentary behaviour | Randomized controlled trial | Conference

Article:

Introduction

Sedentary behaviour (e.g. sitting)(Sedentary Behaviour Research Network, 2012) is associated with increased risk of cardiovascular disease, diabetes, and premature mortality (Wilmot et al., 2012). Lab-based intervention studies suggest that even short periods of prolonged sitting increase health risks in adults (Saunders et al., 2012, Peddie et al., 2013). While prolonged sitting has been linked with rapid and deleterious health consequences, breaks in sedentary time (e.g. standing or walking at a light intensity) are associated with reduced health risks (Healy et al.,

2008, Healy et al., 2011, Saunders et al., 2013, Henson et al., 2013). For example, interrupting prolonged sitting with light intensity activity resulted in a roughly 25% improvement in insulin sensitivity in overweight and obese adults (Dunstan et al., 2012). Other recent studies have also suggested that standing rather than sitting improves glycemic control by 10–40% (Thorp et al., 2014, Buckley et al., 2013).

Conferences typically involve periods of uninterrupted sitting, especially during oral presentations. One technique that may be useful in reducing sedentary time during such presentations is the use of a point-of-decision prompt (PODP). PODPs can be used to inform individuals about the health benefits associated with behavioural change, and have been used with success to prompt individuals to use stairs to increase physical activity levels (Soler et al., 2010, Nocon et al., 2010). Additionally, PODPs are simple, cost-effective interventions that provide an equitable population-based impact (Wu et al., 2011). PODPs have also been used with positive results in encouraging desk-based workers to stand throughout the day to break up sedentary behaviour (Evans et al., 2012, Cooley and Pedersen, 2013). However, results on the effects of PODPs on sedentary behaviour outside of the workplace remain sparse and require further investigation.

The purpose of this study was to examine whether a PODP targeting sedentary behaviour reduction would influence the proportion of attendees standing during presentations at an academic conference. It was hypothesized that a significantly greater proportion of participants would stand during sessions that provided a PODP regarding sedentary behaviour, in comparison to sessions without a PODP.

Methods

This study took place at the Global Summit on the Physical Activity of Children conference (www.activehealthykids.ca) in Toronto, Ontario, Canada, May 2014 and was approved by the Research Ethics Board at the Children's Hospital of Eastern Ontario and by the conference organizers. The conference attracted approximately 800 delegates from > 30 countries.

Twelve of sixteen, one-hour groups of oral presentations sessions, during the first two days of the conference, were included in this study. Six oral presentation sessions were randomly assigned, via a coin flip, to the intervention group, and the remaining six sessions were assigned to the control group. Each session included four fifteen-minute research presentations on topics broadly related to childhood physical activity. Room size and seating arrangements varied across five different presentation rooms. The facilitator for each session was contacted prior to the conference to inform them about the study and whether their session was included in the control or intervention group. If their session was allocated to the intervention group, facilitators were given the PODP (see below). Facilitators were asked to read the PODP at the beginning (before the first presenter) and middle (after the second presenter) of each intervention session.

“Prolonged sitting is associated with increased health risks. We encourage you to reduce and/or interrupt your sedentary time while attending the Global Summit on the Physical Activity of Children. Please feel free to stand during this presentation session”.

Facilitators for control sessions were asked not to promote standing or sitting during their session. All facilitators were asked not to mention the existence of the study until the end of the conference, to avoid influencing the study results.

During each oral presentation session, two researchers independently counted the number of participants at the beginning (first 10 min), middle (30–40 min), and end (50–60 min) of the one-hour sessions. A count consisted of (i) the number of individuals in the room and (ii) the number of individuals standing at any time during the count period — counts were averaged for the two researchers, and across the three count periods. These average values were used to calculate the proportion of individuals standing during each session.

Statistical analysis

Statistical analyses were performed using SPSS version 22.0 (IBM Corp., Armonk, NY, USA). Chi-square analyses were used to compare the proportion of individuals standing during the intervention and control sessions. Correlation analyses were performed to assess inter-rater reliability. Significance was accepted at $p < 0.05$. Data are presented as means \pm standard error unless otherwise noted.

Results

Researchers counted an average of 446.6 audience members attending intervention group sessions, and 371.5 audience members attending control group sessions (Table 1). Counts for the total number of audience members and the number of individuals standing for both researchers were correlated to assess inter-rater reliability, which was near perfect ($ICC = 0.99$). $16.9 \pm 2.0\%$ of attendees chose to stand during the intervention group sessions compared to $10.5 \pm 1.5\%$ in the control group sessions (Fig. 1; $\chi^2 = 7.13$; $p < 0.05$).

Table 1. Comparison across control/intervention grouped presentation sessions with proportions of standing attendees.

Session	Intervention sessions			Control sessions		
	Total attendees	Attendees standing	Proportion standing (%)	Total attendees	Attendees standing	Proportion standing (%)
1	55.5	7.3	13.2	66.2	6.3	9.5
2	75	13.8	18.4	82.2	9.3	11.3
3	104.5	9.2	8.8	146	12.7	8.7
4	71	18.5	26.1	69.5	11.7	16.8
5	50	11.2	22.4	37.7	2	5.3
6	15.5	3	19.4	45	5	11.1
Total	371.5	63	16.9	446.6	47	10.5

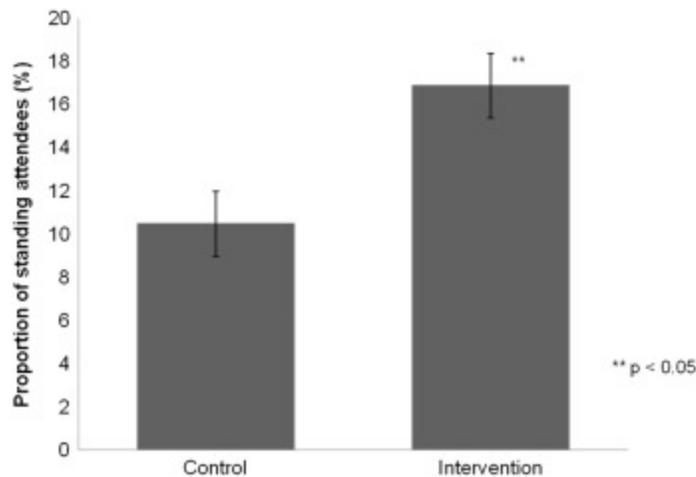


Fig. 1. Comparison between the intervention and control groups. Results are presented as means \pm SE for 446.6 participants in the intervention and 371.5 participants in the control groups (* $p < 0.05$).

Discussion

This study indicated that only 10.5% of attendees chose to stand during sessions that did not include the PODP, whereas roughly 17% of attendees chose to stand after being presented with a PODP on the health impact of prolonged sitting — representing a relative increase of 60%. The proportion of standing attendees across grouped sessions was similar or higher in all intervention sessions when compared to control sessions. This suggests that the PODP was successful at influencing individuals in reducing their sedentary time. These differences were seen despite the fact that many individuals may have attended both intervention and control sessions throughout the conference. Thus, these findings suggest that frequent reminders and/or permission to stand results in more people choosing to do so. These results also support recent studies reporting that PODPs are successful in reducing sedentary behaviour in the workplace setting (Evans et al., 2012, Cooley and Pedersen, 2013).

It is worth noting that even in the intervention condition, less than 1 in 5 participants chose to stand, rather than sit during each session in the current study. This relatively low proportion was seen despite the fact that the audience included attendees who were probably knowledgeable regarding the health impacts of sedentary behaviour. Thus, while the PODP employed did result in a large relative increase in the proportion of individuals choosing to stand, the vast majority of individuals in each session remained seated regardless of there being plenty of space to stand without interfering with the line of sight of seated delegates.

Strengths and weaknesses

The current study employed a rigorous, randomized design and included two independent counters during each session. However, as noted above, conference participants were likely well-informed of the ill effects that increased sedentary time can have on health, and therefore may have been more easily influenced than the lay public. Conversely, this audience may have been more inclined to stand in the control sessions because of their background knowledge. This study also did not assess the behaviour of individual participants; therefore it is unclear whether the

same individuals chose to stand during each session, or whether the individuals differed from one session to the next. Further, data on room size and fullness for each of the five presentation rooms was not collected and, therefore, we were unable to adjust for room size or fullness in the analysis, representing a possible limitation to this study.

Conclusion

The present study demonstrated the effectiveness of an oral PODP in reducing sedentary behaviour at an academic conference. Given their low cost and minimal time commitment, PODPs are a promising population health intervention for the reduction of sedentary behaviour in large group settings, such as conferences. Conference organizers should be encouraged to remind individuals of the benefits of reducing sedentary behaviour. Future research should examine the sit–stand frequency and duration to better understand the potential public health benefits of PODPs. Additionally, future research should explore the versatility of PODP and their potential to influence sedentary behaviour. For instance, PODP may be used to encourage standing ovations following presentations at academic conferences.

Conflict of interest

No conflict of interest.

Financial disclosure

No financial disclosure.

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