

Short Communication

Can Posters Prompt Stair Use in a Worksite Environment?

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Introduction

Up to a third of the population in industrialised countries is completely sedentary, and, as a consequence, runs a two-fold risk of increased mortality^{1, 2}. Encouraging the sedentary to be more active is, therefore, a public health priority¹. In light of evidence of an inverse gradient of risk between clinical disease and physical activity, such that some activity is better than none, exercise recommendations have been expanded to include the accumulation of lifestyle activities, such as walking and stair-climbing³.

Opportunities for stair-climbing are free and readily available to most population groups. Regular stair-climbing also has well documented health dividends such as increased fitness and strength, weight loss, improved lipid profiles and reduced risk of osteoporosis⁴. Research in shopping centres and train stations has shown that poster prompts, placed at the choice point between adjacent escalators and stairs, can significantly increase stair use⁵. Health promoters have, therefore, championed the use of such posters in public places, including worksites. Worksites have been targeted as an important setting for physical activity interventions as most adults spend half their waking hours at their workplace⁶. In a recent review, however, the authors concluded that typical worksite interventions did not increase physical activity levels and that the scientific evaluation of such programmes was poor⁶. While Knadler and Rogers reported that a stair-climbing contest, with incentives and cues, encouraged stair-climbing in a worksite, baseline stair use was not reported⁷. Hence, there has been no formal evaluation of the effectiveness of simple poster prompts in a worksite. This study assessed the effectiveness of a poster prompt to increase stair use in two workplaces.

Methods

A nine-storey worksite with adjacent elevator and stairs was used. In the ground floor hallway of the firm of accountants, a hidden camera was installed with appropriate permission. The camera monitored access to the elevators and staircase only, no individual was identified, and the data were handled securely. Employees' movements were recorded in the morning between 8.00 and 10.00 and at lunchtime between 12.00 and 14.00. Trained observers then coded the videotapes for gender, loads larger than a briefcase or medium-sized bag, and entrance or exit from the staircase or elevator. In this way, both those climbing and descending the stairs were monitored. A two-week baseline period was followed by a two-week intervention period with an A1-sized poster reading "stay healthy, use the stairs", found effective previously in a shopping centre and train station⁵. The poster was positioned at the entrance of the elevator, adjacent to the stairway. Pedestrian traffic volume, a potential confounding variable⁵, was calculated as total number of employees using the stairs and elevator per half-hour. Logistic regression analyses were employed, with elevator/stair use as the dichotomous dependent variable. Poster condition, gender, load and traffic were entered into the models as independent variables. One week after the intervention was withdrawn, a questionnaire was distributed through the internal mail system. In open response formats, respondents were asked to recall the poster and to express what they thought and felt about the message. They also rated their stair-climbing habits in the office, on a five-point likert scale ranging from 'almost never' to 'almost always'. Finally, the floor on which respondents worked, and their age, gender, and stage of change for exercise⁸ were recorded.

Four months later, a second accountancy firm, with four flights of stairs, agreed to participate in the study. A lower storey building was selected as results of the first study indicated that stair height had an important effect on stair usage (see results). Stair and elevator use was monitored by an observer in situ, twice-a-week, at the same times as for the first worksite. In this site, the two-week baseline period was followed by four weeks of the poster intervention. The same coding and logistic regression as that used in the first study were applied. The questionnaire (see above) was also administered. An additional question asked how many flights of stairs participants were willing to climb.

Results

In the first worksite, 12,288 choices between the elevator and stairs were observed. First, stair-climbing was assessed. There was a significant effect of traffic volume (OR: 0.53, CIs: 0.43–0.65); such that fewer

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people used the stairs when other people were using the lift. There was also a significant effect of gender (OR: 1.24, CIs: 1.10–1.40); women used the stairs more than men. Load was not a significant contributor to stair-climbing. There was also no significant effect of the poster (OR: 1.04, CIs: 0.92–1.18) with similar percentages on the stairs at baseline (20.7%) and during the poster intervention (21.5%). Second, employees' use of the stairs for descent was analysed. Traffic volume, gender, and load did not contribute significantly to stair descent. During the poster intervention, however, stair use for descent increased significantly (OR: 1.21, CIs: 1.07–1.37) from 25% to 30%.

In this first worksite, 59 employees (23.6%) returned the questionnaire. Of respondents, 56% recalled the whole message "stay healthy, use the stairs", and a further 37% remembered "use the stairs" only. Most respondents (71%) thought the poster prompt was a good idea. The message, however, made 62% feel negative, namely guilty or lazy. Floor on which the employee worked (59%), time (20%) and load (20%) were reported as barriers to stair use. There were significant differences between the reported habitual stair use (ranging from 1–5) and the floor of the building on which employees worked ($F(8,58)=8.45$, $p<0.0001$), such that those on the lower floors reported using the stairs more than those on the upper floors. There were no other significant differences between employees working on different floors.

In the second worksite (N=2,694), there were no significant effects of traffic volume, but gender (OR: 1.51, CIs: 1.19–1.91) and load (OR: 0.43, CIs: 0.30–0.61) contributed to stair-climbing; men climbed the stairs more

than women, and those carrying a substantial load tended to take the elevator. There was again no significant effect of the poster (OR: 1.22, CIs: 0.96–1.55), although there were slightly higher percentages on the stairs during the poster intervention (23.2%) than at baseline (19.0%). Consistent with the first study, the analyses of employees' use of the stairs for descent showed that there was a significant increase in stair use from 40% to 52% when the poster was in place (OR: 1.31, CIs: 1.00–1.71). The effects of gender (OR: 1.93, CIs: 1.51–2.48) and load (OR: 0.51, CIs: 0.29–0.89) on stair use at descent were also significant. Figure 1 shows stair use for the two time points in both worksites.

A total of 69 employees (27.6%) returned the questionnaire. As in the first workplace, 73% of respondents thought the poster prompt was a good idea, although the message made 47% feel negative, namely guilty or lazy. Floor (29%), load (28%), laziness (28%), and time (14%) were the most frequently reported barriers to stair use. Again, there was a significant relationship between floor on which the employee worked and reported habitual stair use in the office ($F(4,67)=4.49$, $p=0.003$), such that those on the lower floors reported using the stairs more than those on the upper floors. As in the previous study, there were no other significant differences between employees working on different floors. The mean number of flights of stairs respondents were willing to climb was 3.5.

Discussion

Whereas the present message yielded significant increases in stair-climbing with shoppers and commuters⁵, it was ineffective in these worksites,

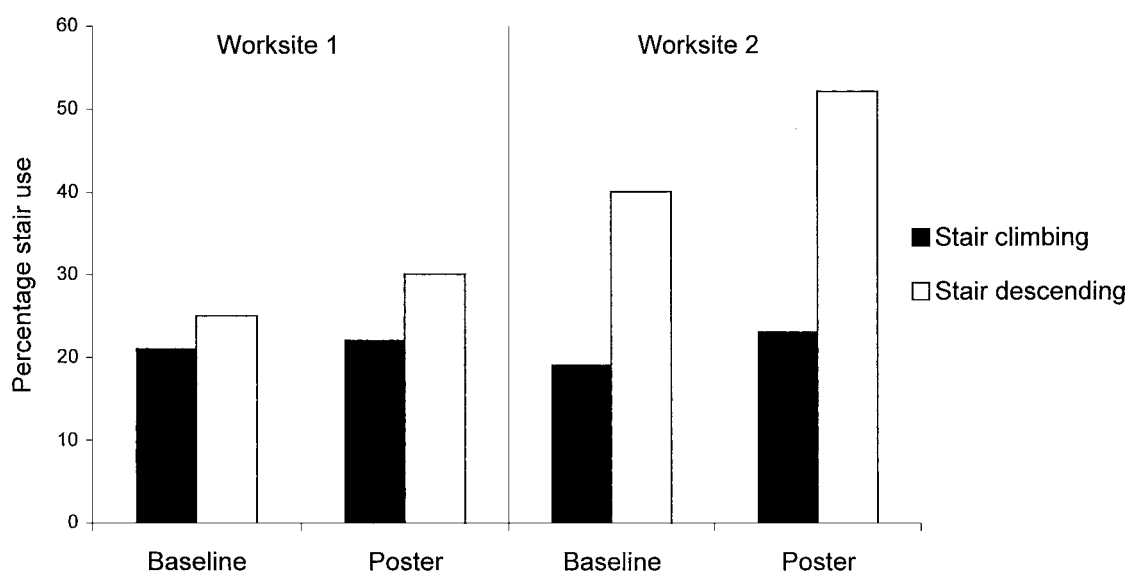


Fig. 1. Stair ascent and decent during baseline and intervention periods in two worksites.

encouraging only stair descent. Stair ascent confers greater health benefits and it may be necessary to advocate stair-climbing, not just stair use, in the worksite environment. While use of a non-equivalent comparison group in an interrupted time series design is optimal, the conclusions of these studies have not been compromised by the absence of a control group. The only plausible threat to validity would be a public health initiative for increased stair use that coincided with the introduction of our intervention. Such an initiative should influence both stair ascent and descent whereas the effects in these studies were restricted to stair descent. Further, it is improbable that public health initiatives coincided exactly with our interventions on two separate occasions.

The non-significant findings for stair ascent also demonstrate the necessity of testing messages in context, and implies that, like tailored health communication, 'one for all' is seldom a suitable strategy⁹⁾. Clearly, the poster was highly visible and memorable. The feelings of laziness and guilt that the message engendered, however, might explain the poster's inability to promote stair-climbing. This is extremely important from a health promotion perspective: if messages make people feel bad, they can reject the message and, in future, ignore other health messages. Messages should, therefore, be encouraging without being prescriptive, and acknowledge the difficulties individuals face when adopting a new behaviour. Exploratory focus group research with the target audience might help to determine the best messages.

A second issue concerns constraints the environment may place on physical activity levels. In the present studies, employees on lower floors reported using the stairs more than their co-workers on higher floors. In an analogous fashion, the number of stairs was found to effect stair use in a shopping centre; more shoppers climbed a 9-step than an 18- or 24-step staircase¹⁰⁾. As employees were willing to climb only 3 flights, a worksite campaign might benefit from messages encouraging stair-climbing between floors. Inclusion of the floor on which employees worked in the logistic regression analyses, however, was precluded by an inability to identify individuals at the observational stage. As employees on higher floors would be unlikely to use the stairs for ascent, their inclusion in the analyses means that the OR for the

poster intervention is a conservative estimate of effects possible with this approach.

In conclusion, contrary to previous findings, a poster recommending stair use encouraged use of stairs for descent, but not ascent. Clearly, health promoters need to acknowledge that poster messages are context specific. The environment also appears to inhibit stair use.

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