

Short Report

Promoting stair climbing in Barcelona: similarities and differences with interventions in English-speaking populations

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This study evaluated the ability of three different messages to encourage stair climbing on the Barcelona underground. Two weeks of baseline were followed by three banner intervention periods with three different messages, each for a 2 week period. Follow-up data was gathered two weeks after removing the messages. Stair climbing increased overall [odds ratio (OR)=1.45; 95% confidence intervals (CIs)=1.25–1.68], with no statistical differences between the messages. During follow-up, stair climbing remained elevated (OR = 1.22; 95% CIs = 1.01–1.48). These preliminary data suggest stair climbing interventions, effective in the UK, may prove successful in Catalonia and Spain. Baseline differences, however, outline the magnitude of the task.

Keywords: Catalonia, health promotion, physical activity, Spain, stair climbing.

Introduction

Two thirds of the European adult population are insufficiently active to meet minimum recommendations of 5 days of 30 min moderate intensity activity each week.¹ The serious health consequences of these low rates have made increased physical activity (PA) a public health priority.² Changing the build environment is one key action to encourage accumulation of PA through active living.² Stair climbing, a lifestyle activity with multiple health benefits, has been promoted successfully in 24/26 interventions with English-speaking populations.^{3–6} Typically, a prompt positioned at the point-of-choice between the stairs and the escalator encourages pedestrians to take the stairs for their health.

Nonetheless, stair climbing interventions can be contextually⁴ and culturally specific.^{7,8} In Hong Kong, point-of-choice interventions were ineffective, with hilly terrain, tropical climate and low rates of PA intentions barriers to success.⁸ Importantly, these failures suggest point-of-choice interventions may not have universal appeal. Here, we provide preliminary data on the effects of a stair climbing intervention in a Mediterranean context, namely Barcelona. Low-baseline rates of stair climbing (<1%) were found in a preliminary study in Barcelona, similar to low rates in Hong Kong (Eves *et al.*, unpublished results). Catalans must overcome high-average temperatures to accumulate lifestyle PA and, like the Hong Kong Chinese, have low rates of intention to increase PA.⁹ As point-of-choice prompts require prior intentions to increase PA for success, low rates of intention will impair their effectiveness.

This study which provides preliminary information on the ability of three different messages to prompt travellers on the Barcelona underground to choose the stairs rather than the escalator was conducted between February and May (2006) when the climate was temperate.

Methods

Ethical approval was obtained from Vic and Birmingham Universities. Three messages, previously successful in the UK, were translated into Catalan and Spanish. Two general messages (i) 'Stay healthy, Use the stairs'; (ii) 'Stay healthy, Save time, Use the stairs',⁴ and one containing a specific health outcome; (iii) '7 minutes of stair climbing a day protects your heart'⁵ were presented on stair riser banners affixed to the middle tier of stairs at the Passeig de Gracia metro station. The intervention measured 0.99 m high × 2 m wide and was centred 2.72 m above the ground. The total height of the climb, 3.84 m, resulted from 24, 0.16 m steps.

In a quasi-experimental, interrupted time series design, a 2 week baseline period was followed by three, 2 week intervention periods with messages one, two and three in that order. A week of monitoring two weeks after removal provided a preliminary test for any maintenance.

Two observers positioned in the exit hall at the top of the stairs coded travellers using a standard protocol^{3–5} for use of stairs or escalator (inter-observer agreement $\kappa=0.92$), gender ($\kappa=0.90$), apparent age (over or under 60 years; $\kappa=0.82$), ethnic status (white versus non-white; $\kappa=0.91$), presence of children (head below shoulder height of accompanying adult; $\kappa=0.87$) and bags larger than medium size ($\kappa=0.85$). Coding from 8.00 a.m. to 10.00 a.m. to ensure moderate temperatures (mean = 13.9°C, range 6.7°–20.4°C) occurred two days a week between 14 February and 3 May 2006.

Multivariate logistic regression analyses of escalator or stair choice employed the dichotomous predictors of intervention, gender, age, ethnic status, accompanying children and carrying a large bag. Pedestrian traffic volume (the total number of pedestrians leaving the station every 30 min) was entered as a continuous variable.

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Table 1 Effects of the intervention and demographic factors

Variable	Combined OR (95% CIs)	Stay healthy OR (95% CIs)	Stay healthy, save time OR (95% CIs)	Seven minutes of stair climbing a day protects the heart OR (95% CIs)
Intervention > baseline	1.45*** (1.25–1.68)	1.50*** (1.27–1.78)	1.35*** (1.13–1.60)	1.53*** (1.30–1.81)
Pedestrian traffic volume	1.006*** (1.004–1.007)	1.006*** (1.004–1.007)	1.006*** (1.004–1.007)	1.006*** (1.004–1.007)
Males > females	1.19*** (1.07–1.32)	1.37*** (1.18–1.59)	1.26** (1.08–1.46)	1.13 (0.97–1.30)
Under 60 years > over 60 years	1.74*** (1.34–2.25)	1.37* (1.00–1.87)	2.01*** (1.36–2.97)	2.07*** (1.40–3.06)
White > non-White	2.53*** (1.63–3.93)	2.01* (1.13–3.60)	1.87* (1.09–3.20)	2.33** (1.27–4.28)
No child > accompanied by child	3.69*** (2.16–6.30)	10.20*** (2.53–4.12)	2.83** (1.39–5.75)	4.15*** (1.84–9.35)
No bag > carrying bag	3.90** (1.60–9.50)	2.32 (0.73–7.37)	5.92* (1.46–23.98)	3.67 (0.90–14.9)

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

Results

Of the 33 119 coded choices, 64% were female, 6.6% were over 60 years old, 3.0% were non-white, 2.2% had accompanying children and 1.0% carried large bags.

Table 1 summarizes the effects of the intervention. Treating all the three messages as a single intervention (Combined), there was a significant increase in stair climbing (baseline = 5.7%; uncorrected intervention = 7.6%). Males, the young and white pedestrians were more likely to use the stairs than the comparison groups ($P < 0.001$) and stair climbing was more common at higher pedestrian traffic volumes ($P < 0.001$), i.e. when more pedestrians left the station. Conversely, accompanying a child or carrying a large bag reduced the likelihood of stair climbing. The effects of the three different messages were similar, with overlapping confidence intervals (CIs). An equivalent analysis of the follow-up period without messages (not shown) revealed stair climbing remained elevated compared with baseline [odds ratio (OR) = 1.22; 95% CIs = 1.01–1.48; $P = 0.04$].

Discussion

These preliminary results for a stair climbing intervention in a Mediterranean context are positive. Point-of-choice prompts encouraged Catalans in the Metro to choose the stairs instead of the escalator, with demographic effects matching those seen in English-speaking populations.^{3–5} These similarities in the overall pattern of results suggest point-of-choice prompts can be effective interventions in a Mediterranean context. Further, as in UK shopping centres, effects of the intervention remained 2 weeks after it was removed.³ This result suggests memory for the targeted behaviour of stair climbing outlasts the intervention. Nonetheless, differences from results in the UK outline the magnitude of the task facing health promotion in Catalonia.

Effects due to concurrent climate can be discounted; it was temperate during the observations. While the overall effect (OR = 1.45) was similar to a recent intervention in a UK station (OR = 1.36),¹⁰ the magnitude of change was lower here (+1.9% versus +3.6%). Baseline rates of stair climbing (5.7%) were also lower than rates seen in train stations elsewhere (sample size weighted average = 19.2%).⁶ The low rates of the behaviour would be consistent with low rates of intention noted in the introduction; 58.4% of Catalan adults were in the Pre-contemplation Stage of Change for regular PA in 2002⁹ whereas in the UK city of the intervention noted above,¹⁰ only 12.4% were Pre-contemplators (Eves, unpublished results). Point-of-choice prompts require a prior intention to change for their effectiveness; lower rates of intention will inevitably translate into the lower magnitude of response seen here. Additionally, increased stair climbing is a current public health target in the UK, with media coverage of the potential benefits. Catalans, however, may be less aware of these benefits and, hence, be less

convinced by the messages. A second explanation for low rates of responsiveness is the volume of pedestrian traffic. Stations are busier than shopping malls (833 versus 592 pedestrians hr^{-1}), and so was this station (753 pedestrians hr^{-1}). Further, the simultaneous wave of passengers leaving stations can obscure stair riser banners placed on the way out and reduce their effectiveness.^{6,10}

Despite the positive results, some limitations of the study should be noted. Observational coding of demographics is inevitably subjective, despite acceptable κ (range 0.82–0.92) and will introduce some error in the estimates. Additionally, low-absolute rates of response to the intervention relative to the UK may reflect either lower rates of intention to be more physically active or differences in attitudes to stair climbing in Catalonia. Interviews of pedestrians leaving the station would be required to test possible reasons for stair choice. Finally, the layout of the station can influence the response to any intervention.^{6,10} Consequently, the estimates here are station specific and may differ if the study was repeated in a different station.

In conclusion, the cultural context of stair climbing interventions influences the response and different cultural contexts provide a good test of the generality of effectiveness. Determinants of intervention responsiveness remain a central question for any PA intervention.

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Key points

- The context which stair climbing interventions occur may facilitate or impede to successfully encourage this behaviour. No published literature has tested the effects of stair climbing interventions in Mediterranean countries.
- The intervention in Barcelona resulted in an overall 45% increase in stair climbing. In the follow-up period without messages 2 weeks later, stair climbing was still elevated (22%) indicating memory for the targeted behaviour.
- Strategies proved to be successful in the UK should also prove to be successful in Catalonia and Spain. However, differences in response rate to the stair climbing intervention were found.
- Investigating the effects of PA interventions in different cultural contexts is a key issue for maximizing the effectiveness across countries and cultures.

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