# Feasibility of objectively measuring habitual physical activity and sedentary behaviour in White British and South Asian toddlers and their parents - the Born in Bradford cohort study

Silvia Costa[1,2], Sally E Barber[3], Noël Cameron[2], Stacy A Clemes[2]

1. UCL Institute of Child Health 2. Loughborough University 3. Born in Bradford Cohort Study

## Background

- It has been suggested that the lower physical activity (PA) levels of South Asians may play a major role in their worse metabolic profile and higher risk for non-communicable diseases (NCDs),[1,2] and that prevention and management of diabetes and other NCDs in South Asians should start early in childhood.[1]
- However, there is no information on the PA or sedentary behaviour (SB) of UK South Asian children aged <8 years, or how early in life differences in PA and SB begin to appear.
- The Born in Bradford (BIB) cohort study[3] presents a remarkable opportunity to address this literature gap. However, difficulties in recruiting South Asian into research have been previously reported, and information on best practices, rates of recruitment,[4] and acceptability of South Asian (adults/children) to wear accelerometers in PA/SB measurement studies is scarce.

**The aim of this study was to assess the feasibility of recruiting and objectively measuring the habitual PA and SB of South Asian and White British toddlers and parents participating in the BIB cohort study.**

## Methods

- BIB is a birth cohort study following over 13500 babies to examine how genetic, nutritional, environmental, behavioural and social factors impact on health and development during childhood and adulthood in a multi-ethnic population.[3]
- Participating families of 2-3 year olds were informed about this sub-study during routine BIB assessments. Interested families provided contact details and were contacted to discuss participating in the study.
- Consenting families received home visits for interviews, questionnaires, anthropometric measurements, and accelerometer delivery and collection.
- Participants (children and parents) were instructed to wear the ActiGraph GT3X+ (at the hip, using an elastic belt) during waking hours for 8 consecutive days.

**Fig. 1 – ActiGraph GT3X on a toddler.**

- Non-wear time was defined as ≥60min and ≥10min consecutive zeros for parents and children respectively. A valid day was defined as ≥10h wear time for the parents and ≥470min wear time (using 70/80 rule)[5] for the children, and ≥3 valid days was considered sufficient to assess habitual PA/SB.
- Chi-square was used to test for differences in recruitment and compliance rates between South Asian and White British participants.

## Results

- 160 families (30%South Asian) provided contact details, 97 (22% South Asians) agreed to enter the study, with more White British families agreeing to enter the study than South Asians (Fig. 2)
- We were unable to organise data collection with 17 families (35% South Asians).
- Most parents reported that their children had no issues and enjoyed wearing the ActiGraph.

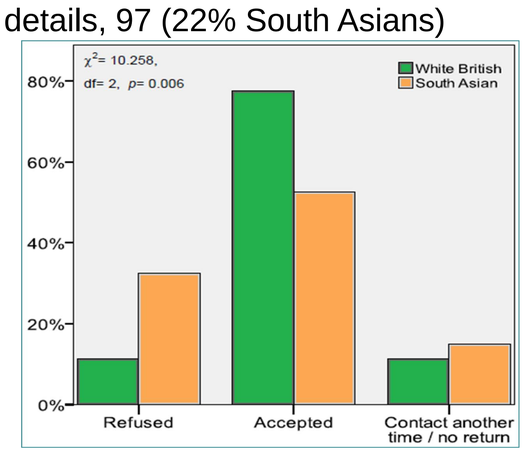


**Fig. 2 – Study intake by ethnicity.**

- Of 89 toddlers issued with an ActiGraph, 85% wore the accelerometer for ≥1 valid day, 34% complied with the 8-day protocol, and 75% provided ≥3 valid days to assess habitual PA/SB. Less South Asian toddlers complied with the 8-day protocol (see Fig. 3 for details of toddlers' compliance by ethnicity).

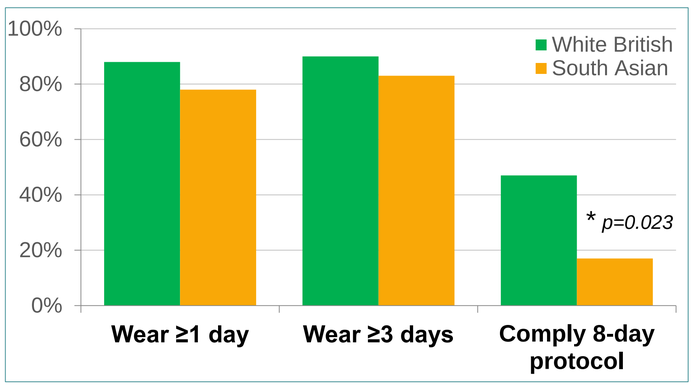


**Fig. 3 – Compliance of toddlers by ethnicity.**

- Of 133 parents (60% mothers; 33% South Asians) issued with an ActiGraph, 93% wore the accelerometer for ≥1 valid day, 41% complied with the 8-day protocol, and 84% provided ≥3 valid days to assess habitual PA/SB. There were no significant differences in compliance between White British and South Asian parents (Fig. 4).

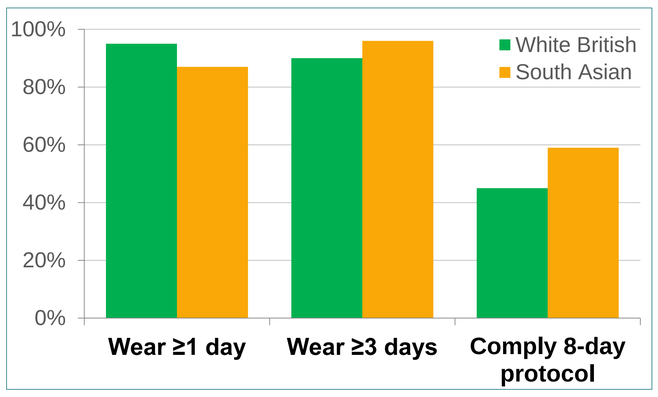


**Fig. 4 – Compliance of parents by ethnicity.**

- Several issues arose during data collection, but several strategies were used and showed success in promoting compliance (details below in Table 1).

**Table 1 – Main issues and successful strategies arising from fieldwork and parent suggestions.**

| *Issues* | *Successful strategies* |
|---|---|
| • Children: refusing to wear accelerometer | • Children: place accelerometer underneath clothes |
| • Children: playing with accelerometer (e.g. hide-and-seek, pulling it around waist) | • Children: provide extra belt (e.g. so parents can change it if original belt gets dirty/wet, avoiding data loss) |
| • Family issues (e.g. divorce, extra work load) making it too burdensome or difficult to remember to wear accelerometer | • Children: use incentives for wearing accelerometer (e.g. colour-in images), or competition with parent. |
| • Loss of accelerometers by participants | • Morning text messages and fridge magnet reminders to wear accelerometers |
| • Use of accelerometer incompatible or difficult with some parents' professions (e.g. asbestos cleaner, policemen) | • Programming the accelerometer with extra day (i.e. allows complying with protocol even if participants forget to wear accelerometer one day) |
| • Available belts not having enough length for some obese parents | • Providing investigator telephone number (e.g. so mothers can clear doubts about protocol) |
| • Very irregular child wear or excessive non-wear, despite parent-report of no issues | • Check-list of all materials/documents needed for visits (e.g. avoid data loss due to missing materials) |
| • Shorter battery life in older ActiGraph models and faulty memory of some devices resulting in partial/total data loss | • Collect parents' opinions/suggestions about documents and protocols – enables refinement of study document/ procedures, minimising burden, and promotes compliance |

## Conclusions

- **South Asian families were harder to recruit, suggesting that greater efforts or different strategies may be required to successfully recruit South Asians into similar studies.**
- **South Asians consenting to participate were as likely as White British families to provide sufficient data to assess habitual PA/SB.**


**References**:
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**Contact**: Dr. Silvia Costa
silvia.costa@ucl.ac.uk