**Table 1. Descriptive characteristics of the study population**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Data level** | **Characteristic** | **Total**  **(*n*=342)** | **South Asian**  **(*n*=202)** | **White British**  **(*n*=140)** | ***p*-value ethnic difference** |
| Participant | Sex (*n* (%)) |  |  |  |  |
| Boys | 175 (51.2%) | 100 (49.5) | 75 (53.6) |  |
| Girls | 167 (48.8%) | 102 (50.5) | 65 (46.4) | 0.46 |
| Area deprivationa (*n* (%)) |  |  |  |  |
| Most deprived 10% | 209 (61.1) | 146 (72.3) | 63 (45.0) |  |
| >10 to 30% | 94 (27.5) | 46 (22.8) | 48 (34.3) |  |
| >30% | 39 (11.4) | 10 (4.9) | 29 (20.7) | <0.001 |
| Annual income (*n* (%)) |  |  |  |  |
| <£6,999 | 36 (27.1) | 19 (22.9) | 17 (34.0) |  |
| £7,000 to £16,999 | 60 (45.1) | 46 (55.4) | 14 (28.0) |  |
| ≥£17,000 | 37 (27.8) | 18 (21.7) | 19 (38.0) | 0.008 |
| Maternal delivery age (*n* (%)) |  |  |  |  |
| <25y | 74 (29.7) | 26 (20.2) | 48 (40.0) |  |
| ≥25 to <30 | 98 (39.4) | 60 (46.5) | 38 (31.7) |  |
| ≥30y | 77 (30.9) | 43 (33.3) | 34 (28.3) | 0.002 |
| Birth weight (*n* (%)) |  |  |  |  |
| Low | 10 (7.8) | 7 (10.8) | 3 (4.8) |  |
| Normal | 77 (60.2) | 44 (67.7) | 33 (52.4) |  |
| High | 41 (32.0) | 14 (21.5) | 27 (42.9) | 0.026 |
|  |  | **Total**  **(*n*=600)** | **South Asian**  **(*n*=380)** | **White British (*n*=220)** |  |
| Time-point | Age (y) | 3.4 ± 0.8 | 3.4 ± 0.9 | 3.2 ± 0.7 | <0.001 |
| Weight statusb (*n* (%)) |  |  |  |  |
| Underweight | 23 (4.7) | 19 (5.9) | 4 (2.4) |  |
| Healthy weight | 371 (76.0) | 251 (77.4) | 120 (73.2) |  |
| Overweight or obese | 94 (19.3) | 54 (16.7) | 40 (24.4) | 0.014 |
|  |  | **Total**  **(*n*=3181)** | **South Asian**  **(*n*=2011)** | **White British (*n*=1170)** |  |
| Daily | Wear time (min/d) | 603.8 (199.3) | 604.3 (208.3) | 601.9 (181.8) | 0.051 |
| Type of day (*n* (%)) |  |  |  |  |
| Weekday | 2418 (76.0) | 1524 (75.8) | 894 (76.4) |  |
| Weekend | 763 (24.0) | 487 (24.2) | 276 (23.6) | 0.69 |
| Season (*n* (%)) |  |  |  |  |
| Winter | 647 (20.3) | 365 (18.2) | 282 (24.1) |  |
| Spring | 729 (22.9) | 404 (20.1) | 325 (27.8) |  |
| Summer | 609 (19.1) | 380 (18.9) | 229 (19.6) |  |
| Autumn | 1196 (37.6) | 862 (42.9) | 334 (28.6) | <0.001 |
| Inactive (*n* (%))c | 2073 (65.2) | 1284 (63.9) | 789 (67.4) | 0.21 |

Ethnic differences were analysed using chi-square tests at the participant level; linear and ordered logistic regression with a random intercept to account for clustering within children at the time-point level; linear and ordered logistic regression with two random intercepts to account for days nested within measurement time-points clustered within children at the daily level. Wear time was skewed and was natural log transformed prior to analysis. aBased on the national measure of relative deprivation for small areas in England. bBased on British growth reference data. cInactive was defined as failing to meet the new international guideline daily amount of physical activity for children aged 3 to 4 years (≥180 minutes of total physical activity including ≥60 minutes MVPA). South Asian ethnicity includes Pakistani (*n*=154), Bangladeshi (*n*=21), Indian (*n*=4), and ‘Other South Asian’ including specific country of origin unknown (*n*=23). MVPA, moderate-to-vigorous physical activity.

**Table 2. Daily levels and patterns of physical activity and sedentary time**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Characteristic** | **Sedentary time (%)** | ***p*-value** | **Light activity (%)** | ***p*-value** | **MVPA (%)** | ***p*-value** | **Vector Magnitude (CPM)** | ***p*-value** |
| South Asian (participants: 202; time-points: 380; 2011 days) | Overall | 48.6 (47.6 to 49.7) | Ref | 42.2 (41.4 to 43.0) | Ref | 8.0 (7.6 to 8.6) | Ref | 1392.9 (1353.3 to 1432.4) | Ref |
| Sex |  |  |  |  |  |  |  |  |
| Boys | 48.2 (46.8 to 49.5) | Ref | 41.8 (40.7 to 42.8) | Ref | 8.9 (8.2 to 9.7) | Ref | 1444.2 (1391.7 to 1496.6) | Ref |
| Girls | 49.5 (48.2 to 50.8) | 0.18 | 42.3 (41.3 to 43.3) | 0.46 | **7.1 (6.6 to 7.7)** | **<0.001** | **1330.3 (1279.8 to 1380.7)** | **0.003** |
| Age (y) |  |  |  |  |  |  |  |  |
| 2 | **50.7 (48.8 to 52.5)** |  | 41.7 (40.3 to 43.2) |  | **6.5 (5.8 to 7.3)** |  | **1285.7 (1213.8 to 1357.5)** |  |
| 3 | **49.5 (48.4 to 50.5)** | *p*-trend | 42.0 (41.1 to 42.8) | *p*-trend | **7.4 (7.0 to 7.9)** | *p*-trend | **1351.2 (1311.3 to 1391.1)** | *p*-trend |
| 4 | **48.3 (47.1 to 49.4)** | **0.036** | 42.2 (41.3 to 43.0) | 0.63 | **8.4 (7.9 to 9.0)** | **<0.001** | **1416.8 (1375.0 to 1458.5)** | **0.003** |
| Area deprivation |  |  |  |  |  |  |  |  |
| Most deprived 10% | 49.1 (48.0 to 50.2) | Ref | 41.9 (41.0 to 42.7) | Ref | 7.9 (7.4 to 8.4) | Ref | 1377.8 (1337.5 to 1418.1) | Ref |
| >10 to 30% | 47.6 (45.5 to 49.8) | 0.23 | 42.9 (41.3 to 44.6) | 0.24 | 8.2 (7.2 to 9.2) | 0.61 | 1418.8 (1338.3 to 1499.3) | 0.38 |
| >30% | 50.1 (46.0 to 54.2) | 0.65 | 41.6 (38.5 to 44.8) | 0.89 | 7.4 (5.9 to 9.3) | 0.60 | 1324.8 (1172.8 to 1476.9) | 0.51 |
| Annual income (£) |  |  |  |  |  |  |  |  |
| <£6,999 | 47.9 (45.8 to 50.0) | Ref | 43.2 (41.4 to 45.0) | Ref | 7.9 (7.2 to 8.8) | Ref | 1389.2 (1320.6 to 1457.9) | Ref |
| £7,000 to £16,999 | 48.5 (46.9 to 50.1) | 0.71 | 42.1 (40.9 to 43.3) | 0.37 | 8.2 (7.5 to 9.0) | 0.62 | 1405.0 (1345.3 to 1464.6) | 0.76 |
| ≥£17,000 | **51.5 (48.9 to 54.0)** | **0.050** | **40.0 (38.0 to 42.0)** | **0.032** | 7.1 (6.1 to 8.2) | 0.24 | 1323.2 (1229.2 to 1417.2) | 0.29 |
| Weight status |  |  |  |  |  |  |  |  |
| Underweight | 49.5 (45.7 to 53.3) | 0.72 | 41.1 (38.2 to 44.0) | 0.52 | 8.0 (6.3 to 10.1) | 0.89 | 1398.7 (1261.0 to 1536.4) | 0.84 |
| Healthy weight | 48.8 (47.8 to 49.9) | Ref | 42.1 (41.3 to 42.9) | Ref | 7.9 (7.4 to 8.4) | Ref | 1384.3 (1345.3 to 1423.3) | Ref |
| Overweight / obese | 49.0 (46.7 to 51.3) | 0.88 | 42.2 (40.4 to 44.0) | 0.95 | 7.9 (6.9 to 9.0) | 0.99 | 1367.9 (1284.2 to 1451.7) | 0.73 |
| Type of day |  |  |  |  |  |  |  |  |
| Weekday | 49.2 (48.3 to 50.2) | Ref | 42.0 (41.3 to 42.7) | Ref | 7.7 (7.3 to 8.1) | Ref | 1360.2 (1325.1 to 1395.3) | Ref |
| Weekend | **47.7 (46.7 to 48.8)** | **<0.001** | 42.3 (41.5 to 43.1) | 0.27 | **8.7 (8.2 to 9.3)** | **<0.001** | **1452.2 (1412.7 to 1491.8)** | **<0.001** |
| Season |  |  |  |  |  |  |  |  |
| Winter | 52.4 (50.6 to 54.2) | Ref | 39.4 (38.0 to 40.9) | Ref | 6.9 (6.2 to 7.8) | Ref | 1262.5 (1197.2 to 1327.8) | Ref |
| Spring | **48.4 (46.5 to 50.4)** | **0.002** | **42.1 (40.6 to 43.6)** | **0.008** | **8.3 (7.4 to 9.3)** | **0.025** | **1413.3 (1342.9 to 1483.6)** | **0.001** |
| Summer | **47.2 (45.5 to 48.8)** | **<0.001** | **43.3 (42.0 to 44.6)** | **<0.001** | **8.5 (7.7 to 9.4)** | **0.004** | **1444.9 (1385.2 to 1504.6)** | **<0.001** |
| Autumn | **48.3 (47.0 to 49.6)** | **<0.001** | **42.6 (41.6 to 43.6)** | **<0.001** | 7.9 (7.3 to 8.5) | 0.051 | **1391.3 (1342.1 to 1440.5)** | **<0.001** |
| Birth weight |  |  |  |  |  |  |  |  |
| Low | 49.7 (46.5 to 52.9) | 0.83 | 42.1 (39.6 to 44.6) | 0.86 | 7.3 (6.0 to 8.8) | 0.65 | 1315.1 (1195.7 to 1434.5) | 0.46 |
| Normal | 49.3 (47.8 to 50.7) | Ref | 41.9 (40.7 to 43.0) | Ref | 7.6 (7.0 to 8.3) | Ref | 1366.4 (1312.8 to 1419.9) | Ref |
| High | 46.7 (43.3 to 50.0) | 0.17 | 42.7 (40.4 to 45.1) | 0.51 | **9.6 (7.8 to 11.7)** | **0.046** | 1510.1 (1371.1 to 1649.1) | 0.062 |
| Maternal delivery age (y) |  |  |  |  |  |  |  |  |
| <25 | 47.7 (45.4 to 50.1) | Ref | 42.9 (41.1 to 44.8) | Ref | 8.2 (7.2 to 9.4) | Ref | 1414.6 (1328.1 to 1501.1) | Ref |
| ≥25 to <30 | 48.0 (46.5 to 49.5) | 0.87 | 42.4 (41.2 to 43.5) | 0.61 | 8.6 (7.9 to 9.4) | 0.60 | 1429.4 (1371.5 to 1487.3) | 0.78 |
| ≥30 | 50.5 (48.8 to 52.2) | 0.069 | 41.3 (40.0 to 42.6) | 0.16 | 7.0 (6.4 to 7.7) | 0.057 | 1313.3 (1251.4 to 1375.2) | 0.071 |
| White British (participants: 140; time-points: 220; days: 1170) | Overall | 49.8 (48.5 to 51.2) | 0.22 | 41.5 (40.4 to 42.5) | 0.28 | 7.5 (6.9 to 8.1) | 0.22 | 1349.5 (1297.7 to 1401.4) | 0.24 |
| Sex |  |  |  |  |  |  |  |  |
| Boys | 49.7 (48.0 to 51.4) | Ref | 41.0 (39.8 to 42.3) | Ref | 8.0 (7.2 to 8.9) | Ref | 1381.1 (1321.5 to 1440.7) | Ref |
| Girls | 48.9 (47.0 to 50.7) | 0.55 | 42.6 (41.2 to 44.0) | 0.10 | 7.4 (6.6 to 8.3) | 0.28 | 1355.7 (1290.4 to 1421.1) | 0.59 |
| Age (y) |  |  |  |  |  |  |  |  |
| 2 | **52.8 (50.6 to 55.0)** |  | **40.1 (38.5 to 41.8)** |  | **6.0 (5.3 to 6.9)** |  | **1217.7 (1141.3 to 1294.1)** |  |
| 3 | **49.9 (48.7 to 51.1)** |  | **41.5 (40.6 to 42.4)** |  | **7.4 (6.9 to 8.0)** |  | **1344.4 (1301.1 to 1387.7)** |  |
| 4 | **47.0 (45.2 to 48.7)** | **<0.001** | **42.9 (41.5 to 44.2)** | **0.027** | **9.1 (8.1 to 10.2)** | **<0.001** | **1471.1 (1408.5 to 1533.8)** | **<0.001** |
| Area deprivation |  |  |  |  |  |  |  |  |
| Most deprived 10% | 49.4 (47.5 to 51.2) | Ref | 41.8 (40.4 to 43.2) | Ref | 7.7 (6.9 to 8.7) | Ref | 1365.5 (1300.2 to 1430.7) | Ref |
| >10 to 30% | 49.6 (47.4 to 51.7) | 0.91 | 41.7 (40.1 to 43.4) | 0.97 | 7.4 (6.5 to 8.5) | 0.69 | 1360.6 (1284.1 to 1437.0) | 0.93 |
| >30% | 48.9 (46.1 to 51.6) | 0.76 | 41.8 (39.7 to 43.9) | 0.99 | 8.2 (6.9 to 9.8) | 0.56 | 1391.3 (1294.5 to 1488.1) | 0.67 |
| Annual income (£) |  |  |  |  |  |  |  |  |
| <£6,999 | 48.9 (46.6 to 51.1) | Ref | 42.2 (40.5 to 44.0) | Ref | 7.4 (6.4 to 8.7) | Ref | 1383.9 (1302.4 to 1465.5) | Ref |
| £7,000 to £16,999 | 50.0 (46.5 to 53.5) | 0.60 | 41.5 (38.9 to 44.1) | 0.65 | 7.3 (5.8 to 9.2) | 0.92 | 1337.3 (1213.3 to 1461.4) | 0.55 |
| ≥£17,000 | 49.5 (47.5 to 51.5) | 0.70 | 41.4 (39.9 to 43.0) | 0.54 | 8.1 (7.1 to 9.3) | 0.47 | 1367.8 (1296.2 to 1439.4) | 0.79 |
| Weight status |  |  |  |  |  |  |  |  |
| Underweight | 51.3 (43.7 to 58.8) | 0.68 | 41.3 (35.6 to 46.9) | 0.94 | 5.7 (3.0 to 10.9) | 0.37 | 1254.6 (992.1 to 1517.1) | 0.45 |
| Healthy weight | 49.7 (48.2 to 51.1) | Ref | 41.5 (40.4 to 42.6) | Ref | 7.7 (7.0 to 8.4) | Ref | 1357.2 (1306.5 to 1407.9) | Ref |
| Overweight / obese | 48.2 (45.8 to 50.7) | 0.32 | 42.5 (40.7 to 44.4) | 0.34 | 8.0 (6.8 to 9.5) | 0.66 | 1413.1 (1325.4 to 1500.7) | 0.29 |
| Type of day |  |  |  |  |  |  |  |  |
| Weekday | 49.4 (48.2 to 50.6) | Ref | 41.9 (41.0 to 42.8) | Ref | 7.6 (7.0 to 8.2) | Ref | 1356.2 (1313.0 to 1399.4) | Ref |
| Weekend | 49.2 (47.7 to 50.6) | 0.68 | 41.3 (40.2 to 42.4) | 0.17 | **8.3 (7.6 to 9.1)** | **<0.001** | **1412.8 (1361.9 to 1463.6)** | **0.002** |
| Season |  |  |  |  |  |  |  |  |
| Winter | 51.0 (49.0 to 53.0) | Ref | 40.6 (39.0 to 42.2) | Ref | 7.1 (6.2 to 8.1) | Ref | 1313.3 (1242.8 to 1383.9) | Ref |
| Spring | **48.3 (46.3 to 50.3)** | **0.039** | 42.2 (40.7 to 43.7) | 0.10 | **8.5 (7.5 to 9.6)** | **0.034** | **1408.4 (1340.0 to 1476.9)** | **0.034** |
| Summer | 48.6 (46.5 to 50.8) | 0.098 | **42.9 (41.3 to 44.6)** | **0.033** | 7.5 (6.6 to 8.6) | 0.54 | 1382.1 (1307.8 to 1456.4) | 0.16 |
| Autumn | 49.4 (47.4 to 51.3) | 0.19 | 41.5 (40.0 to 43.0) | 0.35 | 7.8 (6.9 to 8.8) | 0.26 | 1370.6 (1303.0 to 1438.3) | 0.18 |
| Birth weight |  |  |  |  |  |  |  |  |
| Low | 49.5 (42.8 to 56.3) | 0.89 | 42.0 (37.0 to 47.0) | 0.81 | 6.8 (4.3 to 10.9) | 0.74 | 1356.2 (1114.7 to 1597.7) | 0.90 |
| Normal | 50.0 (47.9 to 52.1) | Ref | 41.3 (39.8 to 42.9) | Ref | 7.4 (6.5 to 8.5) | Ref | 1340.0 (1263.2 to 1416.9) | Ref |
| High | 48.5 (46.1 to 51.0) | 0.42 | 42.2 (40.4 to 43.9) | 0.53 | 8.2 (7.1 to 9.6) | 0.35 | 1403.6 (1311.6 to 1495.7) | 0.37 |
| Maternal delivery age (y) |  |  |  |  |  |  |  |  |
| <25 | 48.0 (46.0 to 50.0) | Ref | 42.7 (41.2 to 44.1) | Ref | 8.3 (7.3 to 9.3) | Ref | 1425.6 (1357.3 to 1493.8) | Ref |
| ≥25 to <30 | 50.8 (48.5 to 53.1) | 0.068 | **40.3 (38.5 to 42.1)** | **0.047** | 7.4 (6.4 to 8.6) | 0.26 | 1338.7 (1256.3 to 1421.1) | 0.12 |
| ≥30 | 49.8 (47.5 to 52.1) | 0.24 | 41.8 (40.0 to 43.5) | 0.46 | 7.4 (6.4 to 8.6) | 0.30 | 1327.6 (1244.0 to 1411.2) | 0.086 |

Statistical analyses performed on multiple (*n*=60) imputed datasets using multilevel linear regression to account for clustering of days within time-points and children. Overall estimates are from analyses of the total sample with ethnic group modelled as an independent variable, *p*-values represent differences compared to the South Asian ethnic group. Otherwise all analyses were stratified by South Asian (202 children; 380 time-points; 2011 days) and white British (140 children; 220 time-points; 1170 days) ethnic groups. All factors were mutually adjusted for one another except area deprivation and annual income which occupied separate models. South Asian ethnicity includes Pakistani (*n*=154), Bangladeshi (*n*=21), Indian (*n*=4), and ‘Other South Asian’ including country of origin unknown (*n*=23). MVPA, moderate-to-vigorous physical activity.