**Supplementary Table S1:** Gross motor skills and physical activity of preschool children from South Africa, by sex

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Total | Boys | Girls  | p value |
| **TGMD-2 variables** | (n=259) | (n=130) | (n=129) |  |
| Locomotor raw score | 35.54 ± 6.34(37, 32-40) | 36.08 ± 5.72(37, 33-40) | 35.00 ± 6.89(36, 31-40) | 0.257 |
| Object control raw score | 29.92 ± 5.64(30, 26-34) | 31.87 ± 5.30(32, 29-35) | 27.96 ± 5.31(28, 25-31) | 0.000 |
| Locomotor standard score | 11.31 ± 2.50(11, 10-13) | 11.35 ± 2.28(11, 10-13) | 11.26 ± 2.71(11, 10-13) | 0.828 |
| Object control standard score | 10.57 ± 2.26(10, 9-12) | 10.38 ± 1.93(10, 9-12) | 10.76 ± 2.54(10, 9-12) | 0.187 |
| Gross motor quotient | 105.49 ± 12.01(106, 97-112) | 105.15 ± 10.22(106, 100-112) | 105.84 ± 13.60(106, 97-115) | 0.497 |
| **Physical activity variables** |  (n=229) |  (n=117) |  (n=132) |  |
| LPA | 337.62 ± 42.97(338.8, 309.7-366.1) | 334.65 ± 39.96 (338.3, 307.6-360.5) | 340.72 ± 45.87(340.6, 311.8-371.75) | 0.287 |
| MPA | 90.53 ± 24.79(90.4, 72.1-107.5) | 97.99 ± 24.97(99.7, 79.9-114.5) | 82.73 ± 22.16(83.15, 64.1-98.15) | 0.000 |
| VPA | 32.24 ± 15.81(30.2, 21-38.9) | 37.02 ± 17.50(35.2, 26.5-47.1) | 27.24 ± 12.01(26.85, 17.5-33.85) | 0.000 |
| MVPA | 122.76 ± 37.95(121.9, 96.6-146.8) | 135.00 ± 39.87(134.9, 108.4-156.1) | 109.98 ± 31.21(112.4, 86.25-131.35) | 0.000 |
| LMVPA | 460.38 ± 65.66(466.3, 416.4-507.2) | 469.66 ± 64.27(471, 429.3-516.3) | 450.69 ± 65.97(453.6, 414.65-494.6) | 0.025 |

Data presented as means ± standard deviation (median, interquartile range), p-values shown for differences between boys and girls.

**Supplementary Table S2:** Gross motor skills and physical activity of preschool children from

urban high-income, urban low-income and rural low-income settings

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Urban high-income | Urban low-income | Rural low-income | p value |
| **TGMD-2 variables** | (n=46) | (n=91) | (n=122) |  |
| Locomotor raw score | 35.17 ± 5.44(36, 34-38) | 36.21 ± 6.25(38, 33-41) | 35.18 ± 6.72(36, (31-40) | 0.252 |
| Object control raw score | 30.63 ± 6.03(31, 28-35) | 29.86 ± 5.06(30, 27-33) | 29.70 ± 5.93(29.5, 25, 34) | 0.494 |
| Locomotor standard score | 10.76 ± 1.46(11, 10-12) | 11.14 ± 2.15(11, 10-13) | 11.6 ± 2.97(11, 10-14) | 0.041\* |
| Object control standard score | 10.48 ± 2.0(10, 9-12) | 10.11 ± 1.79(10, 9-11) | 10.95 ± 2.59(11, 9-13) | 0.040† |
| Gross motor quotient | 103.72 ± 8.90(103, 97-109) | 103.36 ± 9.53(103, 100-109) | 107.75 ± 14.17(109, 100-115) | 0.010\*† |
| **Physical activity variables** | (n=33) | (n=71) | (n=125) | p value |
| LPA | 299.25 ± 34.02 (299.1, 279.8-325.8) | 345. 88 ± 37.35(355.1, 321.3-369.8) | 343.07 ± 42.97(343.2, 320.7-371.2) | 0.000\*‡ |
| MPA | 75.15 ± 18.36(75.3, 64.2-83.2) | 96.22 ± 22.20(98.6, 79.6-111.1) | 91.36 ± 26.13(90.6, 71.7-108.4) | 0.000\*‡ |
| VPA | 33.3 ± 14.87(332., 23.6-45.5) | 34.84 ± 12.98(33.9, 26.9-43.9) | 30.48 ± 17.33(27.1, 17.4-37.4) | 0.008§ |
| MVPA | 108.44 ± 30.74(106.9, 85.8-126.6) | 131.07 ± 32.28(131.8, 112.5-155.5) | 121.83 ± 41.49(118, 91.8-145.1) | 0.004‡§ |
| LMVPA | 408.69 ± 51.37(413.7, 382.4-440.2) | 476.95 ± 56.77(481.5, 435.3-516.6) | 464.89 ± 67.16(469.5, 422.4-506.6) | 0.000\*‡ |

Data presented as means ± standard deviation (median, interquartile range), p-values shown for differences between settings. \*Rural low-income significantly higher than urban high-income.

†Rural significantly higher than urban low-income. ‡Urban low-income higher than urban high-income. §Urban low-income higher than rural low-income.

**Supplementary Table S3:** Correlation matrix showing associations between adiposity,

physical activity and gross motor skills for the total sample

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Age (yrs) | BMI | BAZ | HAZ | WAZ | LRS | OCRS | SRS | MVPA | LMVPA | LPA | MPA | VPA |
| Age (yrs) | 1.000 |  |  |  |  |  |  |  |  |  |  |  |  |
| BMI | -0.0244 | 1.000 |  |  |  |  |  |  |  |  |  |  |  |
| BAZ | -0.0294 | 0.9850\* | 1.000 |  |  |  |  |  |  |  |  |  |  |
| HAZ | 0.0367 | 0.1655\* | 0.1457\* | 1.000 |  |  |  |  |  |  |  |  |  |
| WAZ | 0.0077 | 0.7755\* | 0.7680\* | 0.7419\* | 1.000 |  |  |  |  |  |  |  |  |
| LRS | 0.4409\* | 0.0217 | 0.0201 | 0.0472 | 0.0555 | 1.000 |  |  |  |  |  |  |  |
| OCRS | 0.4000\* | -0.0576 | -0.0618 | 0.0115 | -0.0226 | 0.3933\* | 1.000 |  |  |  |  |  |  |
| SRS | 0.5048\* | -0.0187 | -0.0221 | 0.0364 | 0.0224 | 0.8551\* | 0.8129\* | 1.000 |  |  |  |  |  |
| MVPA | 0.2711\* | 0.1596\* | 0.1905\* | -0.0405 | 0.1078 | 0.3134\* | 0.2847\* | 0.3596\* | 1.000 |  |  |  |  |
| LMVPA | 0.1323\* | 0.1718\* | 0.2023\* | -0.1066 | 0.0748 | 0.2133\* | 0.0888 | 0.1856\* | 0.7836\* | 1.000 |  |  |  |
| LPA | -0.0374 | 0.1216 | 0.1408\* | -0.1271 | 0.0190 | 0.0492 | -0.1149 | -0.0335 | 0.3141\* | 0.8360\* | 1.000 |  |  |
| MPA | 0.2035\* | 0.1598\* | 0.1893\* | -0.0855 | 0.0792 | 0.2463\* | 0.2243\* | 0.2829\* | 0.9592\* | 0.8532\* | 0.4566\* | 1.000 |  |
| VPA | 0.3316\* | 0.1325\* | 0.1604\* | 0.0367 | 0.1345\* | 0.3650\* | 0.3306\* | 0.4183\* | 0.8963\* | 0.5428\* | 0.0378 | 0.7343\* | 1.000 |

LRS = locomotor raw score, OCRS = object control raw score, SRS = sum of raw scores, MVPA = moderate-to-vigorous-intensity physical activity, LMVPA = light and moderate-to-vigorous-intensity physical activity, LPA = light-intensity physical activity, MPA = moderate-intensity physical activity, VPA = vigorous-intensity physical activity.

**Supplementary Table S4:** Correlation matrix showing associations between adiposity,

physical activity and gross motor skills for urban high-income sample

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Age (yrs) | BMI | BAZ | HAZ | WAZ | LRS | OCRS | SRS | MVPA | LMVPA | LPA | MPA | VPA |
| Age (yrs) | 1.000 |  |  |  |  |  |  |  |  |  |  |  |  |
| BMI | -0.0709 | 1.000 |  |  |  |  |  |  |  |  |  |  |  |
| BAZ | -0.0812 | 0.9938\* | 1.000 |  |  |  |  |  |  |  |  |  |  |
| HAZ | 0.0456 | 0.4265\* | 0.4288\* | 1.000 |  |  |  |  |  |  |  |  |  |
| WAZ | -0.0159 | 0.8279\* | 0.8324\* | 0.8557\* | 1.000 |  |  |  |  |  |  |  |  |
| LRS | 0.6611\* | 0.1283 | 0.1199 | 0.0074 | 0.0765 | 1.000 |  |  |  |  |  |  |  |
| OCRS | 0.4093\* | 0.0451 | 0.0244 | 0.0484 | 0.0512 | 0.5125\* | 1.000 |  |  |  |  |  |  |
| SRS | 0.6077\* | 0.0972 | 0.0801 | 0.0333 | 0.0726 | 0.8549\* | 0.8837\* | 1.000 |  |  |  |  |  |
| MVPA | 0.2050 | -0.1324 | -0.1187 | 0.2231 | 0.0830 | 0.2206 | 0.3369 | 0.3133 | 1.000 |  |  |  |  |
| LMVPA | 0.2350 | -0.2415 | -0.2281 | 0.0832 | -0.0620 | 0.1744 | 0.1828 | 0.1990 | 0.7684\* | 1.000 |  |  |  |
| LPA | 0.1693 | -0.2451 | -0.2374 | -0.0759 | -0.1687 | 0.0638 | -0.0286 | 0.0172 | 0.2572 | 0.8161\* | 1.000 |  |  |
| MPA | 0.1979 | -0.2045 | -0.1857 | 0.0984 | -0.0247 | 0.1301 | 0.3519\* | 0.2740 | 0.9396\* | 0.7418\* | 0.2717 | 1.000 |  |
| VPA | 0.1786 | -0.0209 | -0.0157 | 0.3392 | 0.2019 | 0.2950 | 0.2619 | 0.3090 | 0.9062\* | 0.6723\* | 0.1968 | 0.7066\* | 1.000 |

LRS = locomotor raw score, OCRS = object control raw score, SRS = sum of raw scores, MVPA = moderate-to-vigorous-intensity physical activity, LMVPA = light and moderate-to-vigorous-intensity physical activity, LPA = light-intensity physical activity, MPA = moderate-intensity physical activity, VPA = vigorous-intensity physical activity.

**Supplementary Table S5:** Correlation matrix showing associations between body composition,

physical activity and gross motor skills for the urban low-income sample

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Age (yrs) | BMI | BAZ | HAZ | WAZ | LRS | OCRS | SRS | MVPA | LMVPA | LPA | MPA | VPA |
| Age (yrs) | 1.000 |  |  |  |  |  |  |  |  |  |  |  |  |
| BMI | -0.1894 | 1.000 |  |  |  |  |  |  |  |  |  |  |  |
| BAZ | -0.2218\* | 0.945\* | 1.000 |  |  |  |  |  |  |  |  |  |  |
| HAZ | -0.0931 | 0.3706\* | 0.3780\* | 1.000 |  |  |  |  |  |  |  |  |  |
| WAZ | -0.1805 | 0.8389\* | 0.8506\* | 0.8067\* | 1.000 |  |  |  |  |  |  |  |  |
| LRS | 0.4974\* | -0.0984 | -0.0847 | 0.1287 | 0.0327 | 1.000 |  |  |  |  |  |  |  |
| OCRS | 0.4685\* | -0.2263\* | -0.2325\* | 0.0435 | -0.116 | 0.4285\* | 1.000 |  |  |  |  |  |  |
| SRS | 0.5720\* | -0.1837 | -0.1780 | 0.1070 | -0.0376 | 0.8789\* | 0.8077\* | 1.000 |  |  |  |  |  |
| MVPA | 0.1705 | 0.0737 | 0.1375 | 0.0592 | 0.1228 | 0.3271\* | 0.3009\* | 0.3772\* | 1.000 |  |  |  |  |
| LMVPA | -0.0062 | 0.0933 | 0.1573 | 0.2324 | 0.2360\* | 0.2336\* | 0.0824 | 0.2000 | 0.7833\* | 1.000 |  |  |  |
| LPA | -0.1569 | 0.0781 | 0.1203 | 0.3021\* | 0.2524\* | 0.0723 | -0.1349 | -0.0221 | 0.3263\* | 0.8432\* | 1.000 |  |  |
| MPA | 0.1081 | 0.1203 | 0.1837 | 0.1084 | 0.1788 | 0.2626\* | 0.2275 | 0.2954\* | 0.9533\* | 0.8735\* | 0.5038\* | 1.000 |  |
| VPA | 0.2405\* | -0.0224 | 0.0278 | -0.0386 | -0.0005 | 0.3649\* | 0.3598\* | 0.4334\* | 0.8558\* | 0.4528\* | -0.0516 | 0.6596\* | 1.000 |

LRS = locomotor raw score, OCRS = object control raw score, SRS = sum of raw scores, MVPA = moderate-to-vigorous-intensity physical activity, LMVPA = light and moderate-to-vigorous-intensity physical activity, LPA = light-intensity physical activity, MPA = moderate-intensity physical activity, VPA = vigorous-intensity physical activity.

**Supplementary Table S6:** Correlation matrix showing associations between body composition,

physical activity and gross motor skills for the rural low-income sample

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Age (yrs) | BMI | BAZ | HAZ | WAZ | LRS | OCRS | SRS | MVPA | LMVPA | LPA | MPA | VPA |
| Age (yrs) | 1.000 |  |  |  |  |  |  |  |  |  |  |  |  |
| BMI | 0.0403 | 1.000 |  |  |  |  |  |  |  |  |  |  |  |
| BAZ | 0.0495 | 0.9857\* | 1.000 |  |  |  |  |  |  |  |  |  |  |
| HAZ | 0.1213 | 0.0617 | 0.0219 | 1.000 |  |  |  |  |  |  |  |  |  |
| WAZ | 0.1208 | 0.7456\* | 0.7226\* | 0.7019\* | 1.000 |  |  |  |  |  |  |  |  |
| LRS | 0.3259\* | 0.0525 | 0.0327 | 0.0251 | 0.0545 | 1.000 |  |  |  |  |  |  |  |
| OCRS | 0.3629\* | 0.0392 | 0.0291 | -0.0554 | 0.0019 | 0.3449\* | 1.000 |  |  |  |  |  |  |
| SRS | 0.4182\* | 0.0563 | 0.0378 | -0.0154 | 0.0364 | 0.8442\* | 0.7943\* | 1.000 |  |  |  |  |  |
| MVPA | 0.3359\* | 0.1781\* | 0.1985\* | -0.0725 | 0.1020 | 0.3138\* | 0.2958\* | 0.3730\* | 1.000 |  |  |  |  |
| LMVPA | 0.2099\* | 0.1804\* | 0.2015\* | -0.1855\* | 0.0278 | 0.2049\* | 0.1234 | 0.2034\* | 0.7865\* | 1.000 |  |  |  |
| LPA | 0.0037 | 0.1099 | 0.1231 | -0.2196\* | -0.0550 | 0.0152 | -0.0939 | -0.0442 | 0.2635\* | 0.8030\* | 1.000 |  |  |
| MPA | 0.2766\* | 0.1488 | 0.1680 | -0.1166 | 0.0495 | 0.2497\* | 0.2465\* | 0.3032\* | 0.9704\* | 0.8425\* | 0.3794\* | 1.000 |  |
| VPA | 0.3873\* | 0.2022\* | 0.221\* | 0.0020 | 0.1696 | 0.3736\* | 0.3356\* | 0.4346\* | 0.9316\* | 0.6132\* | 0.0588 | 0.8162\* | 1.000 |

LRS = locomotor raw score, OCRS = object control raw score, SRS = sum of raw scores, MVPA = moderate-to-vigorous-intensity physical activity, LMVPA = light and moderate-to-vigorous-intensity physical activity, LPA = light-intensity physical activity, MPA = moderate-intensity physical activity, VPA = vigorous-intensity physical activity.