Tables for the manuscript

**Environmental and practice factors associated with children’s device-measured physical activity and sedentary time in early childhood education and care centres: A systematic review**

**Table 1. Comparison of physical activity levels and sedentary time spent outdoors relative to indoors in ECEC**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Study ID** | **Study Design** | **Sample size** | **Risk of bias** | **Sedentary time** | **LPA** | **MVPA** | **Total PA** |
| Andersen 2017 (52) | Cross-sectional | 116 | Low | **-** | **-** | **-** | ▲ |
| Copeland 2016 (17) | Cross-sectional | 388 | High | ▼ | ▲ | ▼ | **-** |
| Lahuerta-Contell 2021 (51) | Cross-sectional | 116 | High | - | - | ▲ | **-** |
| Raustorp 2012 (16) | Cross-sectional | 50 | High | ▲ | ▲ | ▲ | ▲ |
| Schlechter 2017 (48) | Cross-sectional | 73 | High | ▲ | **-** | **-** | ▲ |
| Tandon 2015 (49) | Cross-sectional | 98 | High | ▲ | **-** | ▲ | **-** |
| Tandon 2018 {Tandon, 2018 #24} | Cross-sectional | 46 | High | ▲ | ▲ | ▲ | **◄►** |
| Trost 2008a (47) | RCT | 20 | Low | **-** | **-** | ▲ | **-** |
| Trost 2008b (47) | RCT | 22 | Low | **-** | **-** | ▲ | **-** |
| Vanderloo 2013 (50) | Cross-sectional | 31 | High | ▲ | **-** | ▲ | **-** |
| **Summary effect direction** | | | | **◄►** | ▲ | ▲ | ▲ |
| **Abbreviations:**  LPA = Light intensity physical activity; MVPA= moderate-to-vigorous physical activity; TPA= total physical activity; a = intervention group; b = control group.  **Effect direction:**  Study level: ▲= outdoor time benefits outcomes (lower sedentary time; higher physical activity); ▼= outdoor time not associated with improvements in outcomes (higher sedentary time; lower physical activity); ◄► = conflicting findings; ‘-‘ = outcome not assessed.  Summary: ▲= studies show a positive association with outdoor time at ECEC; ◄► = conflicting findings. | | | | | | | |

**Table 2: Comparison of outdoor with indoor ECEC play on LPA, MVPA and sedentary time**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Study ID** | **Study Design** | **Sample size** | **Risk of bias** | **Sedentary time** | **LPA** | **MVPA** |
| Henderson 2015 (54) | Cross-sectional | 447 | Low | - | - | **◄►** |
| Mazzucca 2018 (53) | Cross-sectional | 559 | High | ▲ | ▲ | ▲ |
| Tandon 2015 (49) | Cross-sectional | 98 | High | ▼ | ▲ | ▲ |
| **Summary effect direction** | | | | **◄►** | ▲ | ▲ |
| **Abbreviations:**  LPA = Light intensity physical activity; MVPA= moderate-to-vigorous physical activity.  **Effect direction:**  Study level: ▲= outdoor play benefits outcomes (lower sedentary time; higher physical activity); ▼= outdoor play not associated with improvements in outcomes (higher sedentary time; lower physical activity); ◄► = conflicting findings.  Summary: ▲= studies show a positive association with outdoor play at ECEC; ◄► = conflicting findings. | | | | | | |

**Table 3: Availability of outdoor play space at ECEC on MVPA**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Study ID** | **Study Design** | **Sample size** | **Risk of bias** | **MVPA** |
| Gubbels 2018 (55) | Cross-sectional | 281 | Low | ■ |
| Olesen 2013 (56) | Cross-sectional | 426 | Low | ▲ |
| Stephens 2014 (57) | Cross-sectional | 491 | Low | ▲ |
| Zhang 2021a (58) | Cross-sectional | 242 | High | ▲ |
| **Summary effect direction** | | | | ▲ |
| **Abbreviations:**  MVPA= moderate-to-vigorous physical activity. a= preschoolers only  **Effect direction:**  Study level: ▲= availability of outdoor play space benefits outcomes (higher physical activity); ■ = (summary) statistics not presented.  Summary: ▲= studies show a positive association with availability of outdoor play space at ECEC. | | | | |

**Table 4: Absolute size of outdoor play space at ECEC on physical activity and sedentary time**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Study ID** | **Study Design** | **Sample size** | **Risk of bias** | **Outdoor play area size** | **Sedentary time** | **MVPA** | **TPA** | **Steps** |
| Bell 2015 (20) | Cross-sectional | 328 | Low | ≤ 400m2 vs. > 400m2 | **-** | **-** | **-** | ▲ |
| Boldeman 2011 (63) | Cross-sectional | 169 | High | < 1,200m2 vs. 1,200-3000m2 vs. >3000m2 | **-** | **-** | **-** | ■ |
| Chen 20201 (64) | Cross-sectional | 69 | High | ≤200m2 vs. ~900m2 | ▲ | ▲ | **-** | ▲ |
| Chen 20202 (64) | Cross-sectional | 151 | High | ≤200m2 vs. >2700m2 | ▲ | ▲ | **-** | ▲ |
| Dowda 2009 (26) | Cross-sectional | 299 | Low | < 387m2 vs. ≥ 387m2 | ▲ | ▲ | **-** | **-** |
| Henderson 2015 (54) | Cross-sectional | 447 | Low | < 505m2 vs. ≥ 505m2 | **-** | ▲ | **-** | **-** |
| Hinkley 2016 (60) | Cross-sectional | 731 | High | Not reported | **-** | **-** | ■ | **-** |
| Ng 2020a (27) | Case-control | 120 | High | Not reported | **-** | ■ | ■ | **-** |
| Ng 2020b (27) | Case-control | 103 | High | Not reported | **-** | ■ | ■ | **-** |
| Olesen 2013 (56) | Cross-sectional | 426 | Low | 567m2-5175m2, median 2700m2 | **-** | ◄► | - | **-** |
| Saunders 2019a (59) | RCT | 188 | High | <1,308m2 vs. ≥ 1,308m2 | **-** | ▲ | **-** | **-** |
| Saunders 2019b  (59) | RCT | 191 | High | <1,308m2 vs. ≥ 1,308m2 | **-** | ▲ | **-** | **-** |
| Sugiyama 2012 (61) | Cross-sectional | 107 | High | ≤ 400m2 vs. > 400m2 | ◄► | ▲ | **-** | **-** |
| Tonge 2020 (62) | Cross-sectional | 490 | High | < 400m2 vs. ≥ 400m2 | ▲ | ▲ | ▲ | **-** |
| **Summary effect direction** | | | | | ▲ | ▲ | ◘ | ▲ |
| **Abbreviations:**  MVPA= moderate-to-vigorous physical activity; TPA= total physical activity;; a = intervention group; b = control group; 1= first outdoor play area size comparison; 2 = second outdoor play area size comparison.  **Effect direction:**  Study level: ▲= Absolute size of outdoor play space benefits outcomes (lower sedentary time; higher physical activity); ◄► = conflicting findings; ■ = (summary) statistics not presented; ‘-‘ = outcome not assessed.  **Summary:** ▲= studies show absolute size of outdoor play space at ECEC benefits outcomes (lower sedentary time; higher physical activity); ◘ = insufficient reporting of data. | | | | | | | | |

**Table 5: Comparison of portable outdoor play equipment at ECEC on MVPA and sedentary time**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study ID** | **Study Design** | **Sample size** | **Risk of bias** | **MVPA** | **Sedentary time** |
| Copeland 2016 (17) | Cross-sectional | 388 | High | ■ | - |
| Dowda 2009a (26) | Cross-sectional | 299 | Low | ▲ | ▲ |
| Gubbels 2018 (55) | Cross-sectional | 281 | Low | ▲ | ■ |
| Hannon & Brown 2008 | Before-after | 64 | High | ▲ | ▲ |
| Ng 2020(27) | Case-control | 297 | High | **◄►** | **-** |
| Olesen 2013 (56) | Cross-sectional | 426 | Low | ▼ | - |
| **Summary effect direction** | | | | ▲ | ▲ |
| **Abbreviations:**  MVPA= moderate-to-vigorous physical activity. a = Physical activity promoting v.s. not physical activity promoting ECEC (i.e. ≥ 1 piece of portable outdoor play equipment v.s. no presence of portable outdoor play equipment)  **Effect direction:**  Study level: ▲= portable outdoor play equipment benefits outcomes (lower sedentary time, higher physical activity); ▼= portable outdoor play equipment harms outcomes (higher sedentary time, lower physical activity) ■ = (summary) statistics not presented.  Summary: ▲= studies show a beneficial association with portable outdoor play equipment at ECEC. | | | | | |

**Table 6: Comparison of fixed outdoor play equipment at ECEC on physical activity and sedentary time**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Study ID** | **Study Design** | **Sample size** | **Risk of bias** | **Sedentary time** | **MVPA** | **TPA** |
| Copeland 2016 (17) | Cross-sectional | 388 | High | - | ■ | - |
| Dowda 2009a (26) | Cross-sectional | 299 | Low | ▼ | ▼ | - |
| Gubbels 2018 (55) | Cross-sectional | 281 | Low | - | ■ | - |
| Määttä 2019 (68) | Cross-sectional | 778 | Low | - | - | ▼ |
| Ng 2020(27) | Case-control | 297 | High | - | **◄►** | **◄►** |
| Olesen 2013 (56) | Cross-sectional | 426 | Low | - | ▲ | - |
| Sugiyama 2012 (61) | Cross-sectional | 107 | High | ▲ | ▲ | - |
| **Summary effect direction** | | | | **◄►** | **◄►** | **◄►** |
| **Abbreviations:**  MVPA= moderate-to-vigorous physical activity, TPA= total physical activity. a = Physical activity promoting v.s. not physical activity promoting ECEC (i.e. ≤ 8 pieces of fixed outdoor play equipment v.s. > 8 pieces of fixed outdoor play equipment)  **Effect direction:**  Study level: ▲= fixed outdoor play equipment benefits outcomes (lower sedentary time, higher physical activity); ▼= fixed outdoor play equipment harms outcomes (higher sedentary time, lower physical activity) ◄► = conflicting findings; ■ = (summary) statistics not presented; ‘-‘ = outcome not assessed.  **Summary:** ◄►conflicting or inconclusive findings | | | | | | |