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| Supplementary table 1. Results of the univariate multilevel analysis examining the individual-level variables associated with childhood obesity (*p*＞0.2)  |
| Variables | Categories | n | Prevalence of obesity (%) | OR(95%CI) | *p*-value |
| **Student variables** |  |  |  |  |  |
| Moderate-to-vigorous physical activity at least 1 hour per day  | No | 1845 | 16.6 | 1 |  |
|  | Yes | 339 | 20.4 | 1.09(0.80,1.47) | 0.599 |
| Better dietary pattern | No | 1481 | 17.1 | 1 |  |
|  | Yes | 494 | 17.0 | 0.90(0.68,1.19) | 0.464 |
| **Family variables** |  |  |  |  |  |
| Family socioeconomic status | Average/high | 409 | 15.2 | 1 |  |
|   | Low | 1349 | 18.4 | 1.20(0.85,1.70) | 0.301 |

Adjusted for sex, age, and school location (rural or urban) with school as a random effect

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| Supplementary table 2. Results of the univariate multilevel analysis examining the school-level variables associated with childhood obesity (*p*＞0.2) |
| Variables | Categories | n\* (2201) † | Prevalence of obesity (%) | OR(95%CI) | *p*-value |
| **School personnel allocation** |  |  |  |  |  |
| School health professional at least has bachelor degree | No | 16(971) | 18.2 | 1 |  |
|  | Yes | 21(1230) | 16.3 | 0.83(0.62,1.11) | 0.216 |
| The obesity-related school manager belongs to key departments | No | 21(1200) | 17.7 | 1 |  |
|  | Yes | 16(1001) | 16.6 | 0.89(0.66,1.19) | 0.415 |
| The obesity prevention management committee or team is fully in place | No | 28(1633) | 17.3 | 1 |  |
|  | Yes | 9(568) | 16.9 | 1.01(0.71,1.41) | 0.978 |
| **School management policies** |  |  |  |  |  |
| Written school obesity prevention guidelines | No | 15(880) | 17.5 | 1 |  |
|  | Yes | 22(1321) | 17.0 | 0.93(0.70,1.25) | 0.646 |
| Written school obesity prevention annual work plan | No | 17(988) | 18.3 | 1 |  |
|  | Yes | 20(1213) | 16.2 | 0.86(0.64,1.14) | 0.284 |
| At least 2 times obesity prevention related meetings per school year | No | 19(1086) | 17.2 | 1 |  |
|  | Yes | 18(1115) | 17.1 | 0.95(0.71,1.27) | 0.730 |
| At least 2 times partnership between health and sport department per school year | No | 18(1102) | 16.6 | 1 |  |
|  | Yes | 19(1099) | 17.7 | 1.05(0.77,1.44) | 0.773 |
| The class administrator takes responsibility of obesity prevention | No | 26(1459) | 16.9 | 1 | 　 |
| 　 | Yes | 11(742) | 17.8 | 1.23(0.87,1.75) | 0.250 |
| **School health education** |  |  |  |  |  |
| Having professional health education teachers and courses for students | No | 22(1339) | 16.1 | 1 |  |
|  | Yes | 15(862) | 18.9 | 1.21(0.90,1.63) | 0.211 |
| Offering obesity-related lectures for students | No | 13(793) | 17.7  | 1 |  |
|  | Yes | 24(1408) | 16.9 | 0.97(0.71,1.31) | 0.820 |
| Providing health education courses, lectures, training for students at least 3 times | No | 20(1233) | 17.0 | 1 |  |
| (25th percentile) per year | Yes | 17(968) | 17.5 | 1.01(0.74,1.36) | 0.975 |
| Offering health education courses, lectures, training and activities for parents | No | 19(1109) | 15.5 | 1 |  |
|  | Yes | 18(1092) | 18.9 | 1.30(0.98,1.72) | 0.068 |
| Reporting results and asking the feedback of students’ annual physical examination to parents | No | 22(1291) | 18.1 | 1 |  |
|  | Yes | 15(910) | 15.9 | 0.89(0.65,1.22) | 0.478  |
| Giving suggestions to the parents of overweight/obese students | No | 17(1016) | 16.7 | 1 |  |
|  | Yes | 20(1185) | 17.6 | 1.03(0.76,1.40) | 0.831  |
| Offering health education courses, lectures, training and activities for teachers | No | 28(1680) | 17.9 | 1 |  |
|  | Yes | 9(521) | 15.0 | 0.83(0.59,1.17) | 0.287 |
| **School physical activity** |  |  |  |  |  |
| Offering sports meeting every school year | No | 19(1193) | 17.8  | 1 |  |
|  | Yes | 18(1008) | 16.5 | 0.84(0.62,1.14) | 0.254 |
| Offering intramural sports teams, clubs at least 8 times (75th percentile) per day | No | 28(1652) | 16.9 | 1 |  |
|  | Yes | 9(549) | 18.0 | 1.04(0.75,1.46) | 0.807 |
| Promoting overweight/obesity students’ physical activity involvement | No | 26(1544) | 16.4 | 1 |  |
|  | Yes | 11(657) | 19.0 | 1.18(0.86,1.63) | 0.301 |
| Offering alternative physical activity in extreme weather conditions | No | 12(780) | 16.9  | 1 |  |
|  | Yes | 25(1421) | 17.3 | 0.97(0.69,1.36) | 0.856 |
| Offering physical activity homework in holidays | No | 24(1495) | 17.0 | 1 | 　 |
|  | Yes | 13(706) | 17.6 | 1.00(0.72,1.39) | 0.993 |
| **School food environment** |  |  |  |  |  |
| Offering lunch for students from school canteens  | No | 15(814) | 18.3 | 1 |  |
|  | Yes | 13(746) | 15.7 | 0.91(0.64,1.30) | 0.616 |
| Offering the recipes with food nutritional composition to parents  | No | 20(1094) | 16.0  | 1 |  |
|  | Yes | 8(466) | 19.5 | 1.20(0.82,1.74) | 0.345 |
| Controlling the overeating of overweight/obese students during lunch time | No | 16(914) | 16.1 | 1 | 　 |
| 　 | Yes | 12(646) | 18.4 | 1.12(0.79,1.59) | 0.514 |

Adjusted for sex, age, and school location (rural or urban) with school as a random effect

\* Number of schools

† Number of individuals