**Appendix Figure A1: CONSORT figure for participant flow in the CSC Trial**

6-month follow-up

Assessed: (n= 2865; 88.5%)

Lost to follow-up: (n= 371; 11.5%)

3150 (24.4%) Active Control

(n= 37 schools)

3150 to receive health education as usual

6-month follow-up

Assessed (n= 2787; 88.3%)

Lost to follow-up: (n= 363; 11.5%)

1594 invited to receive Climate Schools Mental Health intervention. 1556 to receive health education as usual

12-month follow-up

Assessed: (n= 2686; 85.3%)

Lost to follow-up: (n= 464; 14.7%)

24-month follow-up

Assessed: (n= 2376; 75.4%)

Lost to follow-up: (n= 774; 24.6%)

15-month follow-up

Assessed (n= 2605; 82.7%)

Lost to follow-up: (n= 545; 17.3%)

18-month follow-up

Assessed: (n= 2538; 80.6%)

Lost to follow-up: (n= 612; 19.4%)

30-month follow-up

Assessed: (n= 2137; 67.8%)

Lost to follow-up: (n= 1013; 32.2%)

Included in analysis (n=3150)

12-month follow-up

Assessed: (n= 2657; 82.1%)

Lost to follow-up: (n= 579; 17.9%)

15-month follow-up

Assessed: (n= 2484; 76.8%)

Lost to follow-up (n= 752; 23.2%)

3236 invited to receive Climate Schools Substance Use intervention

3236 (27.2%) Climate SU

(n= 34 schools)

24-month follow-up

Assessed: (n= 2234; 69.0%)

Lost to follow-up: (n= 1002; 31.0%)

18-month follow-up

Assessed: (n= 2478; 76.5%)

Lost to follow-up: (n= 758; 23.4%)

30-month follow-up

Assessed: (n= 2140; 66.1%)

Lost to follow-up: (n= 1096; 33.9%)

Included in analysis (n=3236)

 6386 completed baseline survey

24-month follow-up

15-month follow-up

18-month follow-up

30-month follow-up

Analysis

Baseline

Climate Schools Substance Use course allocation

Climate Schools Mental Health course allocation

6-month follow-up

12-month follow-up

6386 (100%) Total

(n= 71 schools)

6-month follow-up

Assessed: (n= 5647; 88.4%)

Lost to follow-up: (n= 739; 11.6%)

12-month follow-up

Assessed: (n= 5343; 83.7%)

Lost to follow-up: (n= 1043; 16.3%)

1497 invited to receive Climate Schools Mental Health intervention. 1739 to receive health education as usual

Enrolment

15-month follow-up

Assessed: (n= 5086; 79.7%)

Lost to follow-up (n= 1297; 20.3%)

24-month follow-up

Assessed: (n= 4160; 72.2%)

Lost to follow-up: (n= 1776; 27.8%)

18-month follow-up

Assessed: (n= 5016; 78.5%)

Lost to follow-up: (n= 1370; 21.5%)

30-month follow-up

Assessed: (n= 4277; 67.0%)

Lost to follow-up: (n= 2109; 33.0%)

Included in analysis (n=6386)

**All states**

 556 schools were invited to participate

 468 schools declined due to limited time or other commitments

 88 schools were recruited (12391 students)

 7694 students gave parental consent

 17 schools dropped out and 1308 students declined participation

**Appendix A2: Details of multi-level mixed effects models**

Multilevel mixed-effects generalised linear models were fit for each outcome. To determine the best fitting models for each outcome, successive models were fit for each outcome, and model fit was compared using likelihood ratio tests, AIC and BIC. Likelihood ratio tests were used primarily, however these may be overly conservative when testing variance components, so AIC and BIC were inspected for these parameters (Molenberghs & Verbeke, 2007)

Change over time was modelled using either a single linear change term for Time (representing change over one year), or a linear and a quadratic change term in the fixed effects. The best-fitting terms for change over time were selected by fitting unconditional models to the data, without a Group term for intervention groups. We then compared the fit of the linear and quadratic models to select the best-fitting change function before determining the best-fitting random effects structure.

Due to the clustered design of the study and the repeated observations of each participant, all models included random intercepts at the individual and school levels, to account for the correlation of observations within these levels (Fitzmaurice, Laird, & Ware, 2011). Additional random effects terms were then fitted in successive models to capture additional variation. The random effects terms fitted were, in order: random slopes at the individual level for the linear change over time, a correlation term between the random intercepts and slopes at the individual level, random slopes for the quadratic change over time (where relevant), and for continuous outcomes, an AR(1) autoregressive correlation term for each participant’s residuals. Random effects terms were retained if they improved model fit compared to the previous model, otherwise the previous model was selected as the best fitting model. Where the model with the new term failed to converge or produce valid estimates for random effects terms, the previous model was selected.

**Appendix A3: Coefficients and fit statistics for models of each outcome**

Legend for the tables below:

**LRT**: Likelihood ratio test (conducted against previous model)
**df**: Degrees of freedom
**AIC**: Akaike information criterion
**BIC**: Bayesian information criterion

**Table A1: Fit statistics for unconditional models of alcohol knowledge**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Model | LRT χ² | LRT df | LRT p | log-likelihood | df | AIC | BIC |
| Intercept only | . | . | . | -45280.6 | 2 | 90565.2 | 90580.7 |
| Individual random intercepts | 3367.2 | 1 | < 0.0001 | -43597.0 | 3 | 87200.1 | 87223.4 |
| Individual and school random intercepts | 1394.8 | 1 | < 0.0001 | -42899.6 | 4 | 85807.3 | 85838.3 |
| Linear change | 180.2 | 1 | < 0.0001 | -42809.5 | 5 | 85629.1 | 85667.9 |
| Quadratic change | 298.2 | 1 | < 0.0001 | -42660.4 | 6 | 85332.9 | 85379.4 |
| Individual random slopes | 273.4 | 1 | < 0.0001 | -42523.7 | 7 | 85061.5 | 85115.8 |
| Correlated random intercepts and slopes | 14.6 | 1 | 0.00013 | -42516.4 | 8 | 85048.9 | 85110.9 |
| Individual random slopes and quadratic slopes | -0.0 | 1 | 1.0 | -42523.7 | 8 | 85063.5 | 85125.5 |
| AR(1) correlated residuals | 0.0 | 1 | 0.87 | -42523.7 | 8 | 85063.5 | 85125.5 |

The final model selected included school-level random intercepts, individual-level random intercepts and slopes, and quadratic change in the fixed effects.

**Table A2: Alcohol knowledge, unadjusted model**

|  |  |  |  |
| --- | --- | --- | --- |
| n = 6382 | b | z | p |
| Time | 0.33 (-0.09 to 0.75) | 1.55 | 0.12 |
| Time² | -0.49 (-0.89 to -0.08) | -2.34 | 0.019 |
| Climate | 0.52 (0.01 to 1.02) | 2.01 | 0.044 |
| Climate × Time | 5.86 (5.27 to 6.45) | 19.45 | < 0.0001 |
| Climate × Time² | -4.43 (-5.01 to -3.86) | -15.15 | < 0.0001 |
| Intercept | 7.89 (7.54 to 8.24) | 44.17 | < 0.0001 |
| Var(Intercept [Schools]) | 1.05 (0.73 to 1.51) | 0.29 | 0.77 |
| Var(Slope [Individuals]) | 2.26 (1.73 to 2.94) | 6.01 | < 0.0001 |
| Var(Intercept [Individuals]) | 2.94 (2.65 to 3.25) | 20.89 | < 0.0001 |
| Cor(Slope, Intercept [Individuals]) | 0.24 (0.07 to 0.39) | 2.77 | 0.0056 |
| Var(Residual) | 4.84 (4.65 to 5.03) | 79.89 | < 0.0001 |

**Table A3: Alcohol knowledge, adjusted model**

|  |  |  |  |
| --- | --- | --- | --- |
| n = 6020 | b | z | p |
| Time | 0.33 (-0.10 to 0.76) | 1.50 | 0.13 |
| Time² | -0.47 (-0.89 to -0.05) | -2.21 | 0.027 |
| Climate | 0.48 (-0.02 to 0.97) | 1.88 | 0.060 |
| Climate × Time | 5.90 (5.30 to 6.50) | 19.19 | < 0.0001 |
| Climate × Time² | -4.43 (-5.02 to -3.85) | -14.84 | < 0.0001 |
| Female | -0.30 (-0.45 to -0.16) | -4.16 | < 0.0001 |
| School type: Private | -0.02 (-0.58 to 0.55) | -0.06 | 0.96 |
| School type: Catholic | -0.16 (-0.85 to 0.52) | -0.46 | 0.64 |
| Any truancy | -0.52 (-0.73 to -0.31) | -4.96 | < 0.0001 |
| Depression | -0.37 (-0.60 to -0.14) | -3.20 | 0.0014 |
| Anxiety | 0.36 (0.10 to 0.62) | 2.68 | 0.0073 |
| Intercept | 8.19 (7.75 to 8.62) | 36.91 | < 0.0001 |
| Var(Intercept [Schools]) | 0.95 (0.66 to 1.37) | -0.28 | 0.78 |
| Var(Slope [Individuals]) | 2.23 (1.70 to 2.93) | 5.78 | < 0.0001 |
| Var(Intercept [Individuals]) | 2.88 (2.60 to 3.20) | 19.92 | < 0.0001 |
| Cor(Slope, Intercept [Individuals]) | 0.26 (0.08 to 0.42) | 2.83 | 0.0046 |
| Var(Residual) | 4.78 (4.60 to 4.97) | 77.37 | < 0.0001 |

**Table A4: Fit statistics for unconditional models of cannabis knowledge**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Model | LRT χ² | LRT df | LRT p | log-likelihood | df | AIC | BIC |
| Intercept only | . | . | . | -49215.3 | 2 | 98434.5 | 98450.0 |
| Individual random intercepts | 3177.4 | 1 | < 0.0001 | -47626.5 | 3 | 95259.1 | 95282.3 |
| Individual and school random intercepts | 1264.1 | 1 | < 0.0001 | -46994.5 | 4 | 93997.0 | 94028.0 |
| Linear change | 457.1 | 1 | < 0.0001 | -46765.9 | 5 | 93541.8 | 93580.6 |
| Quadratic change | 383.8 | 1 | < 0.0001 | -46574.0 | 6 | 93160.1 | 93206.5 |
| Individual random slopes | 133.2 | 1 | < 0.0001 | -46507.5 | 7 | 93028.9 | 93083.1 |
| Correlated random intercepts and slopes | 8.9 | 1 | 0.0029 | -46503.0 | 8 | 93022.1 | 93084.0 |
| AR(1) correlated residuals | 12.5 | 1 | 0.00041 | -46496.8 | 9 | 93011.6 | 93081.3 |

The final model included random intercepts at the school level, random intercepts and slopes at the individual level with a correlation between them, and allowed for AR(1) correlated residuals. A model with random slopes for the quadratic effect of time did not converge.

**Table A5: Multilevel model for cannabis knowledge (unadjusted)**

|  |  |  |  |
| --- | --- | --- | --- |
| n = 6364 | b | z | p |
| Time | 0.94 (0.41 to 1.48) | 3.49 | 0.00049 |
| Time² | -0.73 (-1.25 to -0.22) | -2.80 | 0.0050 |
| Climate | 0.73 (0.12 to 1.34) | 2.34 | 0.019 |
| Climate × Time | 8.49 (7.74 to 9.24) | 22.24 | < 0.0001 |
| Climate × Time² | -6.53 (-7.25 to -5.80) | -17.65 | < 0.0001 |
| Intercept | 7.33 (6.91 to 7.76) | 33.92 | < 0.0001 |
| Var(Intercept [Schools]) | 1.50 (1.04 to 2.18) | 2.14 | 0.032 |
| Var(Slope [Individuals]) | 1.31 (0.19 to 8.90) | 0.28 | 0.78 |
| Var(Intercept [Individuals]) | 4.59 (3.14 to 6.70) | 7.86 | < 0.0001 |
| Cor(Slope, Intercept [Individuals]) | 0.28 (-0.53 to 0.82) | 0.64 | 0.52 |
| Var(Residual) | 9.70 (8.24 to 11.41) | 27.40 | < 0.0001 |
| AR(1) correlation | 0.17 (0.07 to 0.28) | 3.27 | 0.0011 |

**Table A6: Multilevel model for cannabis knowledge (adjusted)**

|  |  |  |  |
| --- | --- | --- | --- |
| n = 5995 | b | z | p |
| Time | 0.91 (0.37 to 1.46) | 3.28 | 0.0011 |
| Time² | -0.67 (-1.20 to -0.14) | -2.49 | 0.013 |
| Climate | 0.56 (-0.04 to 1.17) | 1.84 | 0.066 |
| Climate × Time | 8.77 (8.00 to 9.53) | 22.41 | < 0.0001 |
| Climate × Time² | -6.73 (-7.47 to -5.98) | -17.74 | < 0.0001 |
| Female | -0.50 (-0.69 to -0.31) | -5.14 | < 0.0001 |
| School type: Private | -0.34 (-1.02 to 0.35) | -0.96 | 0.33 |
| School type: Catholic | -0.26 (-1.09 to 0.56) | -0.62 | 0.53 |
| 2.BaselineFull6 | 0.80 (0.44 to 1.15) | 4.41 | < 0.0001 |
| Any truancy | -0.36 (-0.64 to -0.09) | -2.60 | 0.0093 |
| Depression | 0.01 (-0.29 to 0.31) | 0.07 | 0.95 |
| Anxiety | 0.43 (0.09 to 0.78) | 2.46 | 0.014 |
| Intercept | 7.79 (7.26 to 8.32) | 28.76 | < 0.0001 |
| Var(Intercept [Schools]) | 1.36 (0.93 to 1.99) | 1.58 | 0.11 |
| Var(Slope [Individuals]) | 1.05 (0.09 to 12.06) | 0.04 | 0.97 |
| Var(Intercept [Individuals]) | 4.28 (2.83 to 6.49) | 6.88 | < 0.0001 |
| Cor(Slope, Intercept [Individuals]) | 0.42 (-0.76 to 0.95) | 0.61 | 0.54 |
| Var(Residual) | 9.71 (8.22 to 11.46) | 26.83 | < 0.0001 |
| AR(1) correlation | 0.18 (0.07 to 0.28) | 3.23 | 0.0012 |

**Table A7: Fit statistics for unconditional models of drinking (full standard drink)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Model | LRT χ² | LRT df | LRT p | log-likelihood | df | AIC | BIC |
| Intercept only | . | . | . | -5152.1 | 1 | 10306.2 | 10313.9 |
| Individual random intercepts | 1238.5 | 1 | < 0.0001 | -4532.9 | 2 | 9069.8 | 9085.2 |
| Individual and school random intercepts | 400.2 | 1 | < 0.0001 | -4332.8 | 3 | 8671.6 | 8694.8 |
| Linear change | 297.0 | 1 | < 0.0001 | -4184.3 | 4 | 8376.6 | 8407.6 |
| Quadratic change | 2.1 | 1 | 0.15 | -4183.2 | 5 | 8376.5 | 8415.2 |

The final model selected used individual and school-level random intercepts, and linear change in the fixed effects. A model with random slopes at the individual level did not converge.

**Table A8: Multilevel model for drinking (unadjusted)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| n = 6377 | b | z | OR | p |
| Time | 1.90 (1.61 to 2.20) | 12.52 | 6.71 (4.98 to 9.04) | < 0.0001 |
| Climate | 0.66 (-0.10 to 1.41) | 1.70 | 1.93 (0.90 to 4.11) | 0.089 |
| Climate × Time | -0.47 (-0.85 to -0.10) | -2.46 | 0.62 (0.43 to 0.91) | 0.014 |
| Intercept | -5.98 (-6.60 to -5.36) | -18.85 | . | < 0.0001 |
| Var(Intercept [Schools]) | 2.14 (1.26 to 3.01) | 4.79 | . | < 0.0001 |
| Var(Intercept [Individuals]) | 8.42 (6.83 to 10.01) | 10.38 | . | < 0.0001 |

**Table A9: Multilevel model for drinking(adjusted)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| n = 6020 | b | z | OR | p |
| Time | 1.88 (1.57 to 2.19) | 12.06 | 6.56 (4.83 to 8.90) | < 0.0001 |
| Climate | 0.56 (-0.20 to 1.32) | 1.44 | 1.75 (0.82 to 3.75) | 0.15 |
| Climate × Time | -0.46 (-0.85 to -0.08) | -2.34 | 0.63 (0.43 to 0.93) | 0.019 |
| Female | -0.52 (-0.80 to -0.24) | -3.64 | 0.59 (0.45 to 0.79) | 0.00027 |
| School type: Private | 0.08 (-0.76 to 0.93) | 0.20 | 1.09 (0.47 to 2.53) | 0.84 |
| School type: Catholic | 0.22 (-0.75 to 1.19) | 0.45 | 1.25 (0.47 to 3.29) | 0.65 |
| Any truancy | 1.60 (1.25 to 1.95) | 8.92 | 4.96 (3.49 to 7.05) | < 0.0001 |
| Depression | 1.17 (0.77 to 1.57) | 5.74 | 3.22 (2.16 to 4.81) | < 0.0001 |
| Anxiety | 1.02 (0.57 to 1.46) | 4.50 | 2.76 (1.77 to 4.30) | < 0.0001 |
| Intercept | -6.13 (-6.89 to -5.37) | -15.77 | . | < 0.0001 |
| Var(Intercept [Schools]) | 1.95 (1.13 to 2.78) | 4.65 | . | < 0.0001 |
| Var(Intercept [Individuals]) | 7.04 (5.74 to 8.34) | 10.60 | . | < 0.0001 |

**Table A10: Fit statistics for unconditional models of heavy episodic drinking**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Model | LRT χ² | LRT df | LRT p | log-likelihood | df | AIC | BIC |
| Intercept only | . | . | . | -2305.0 | 1 | 4611.9 | 4619.7 |
| Individual random intercepts | 440.0 | 1 | < 0.0001 | -2085.0 | 2 | 4173.9 | 4189.4 |
| Individual and school random intercepts | 195.8 | 1 | < 0.0001 | -1987.1 | 3 | 3980.1 | 4003.4 |
| Linear change | 152.3 | 1 | < 0.0001 | -1910.9 | 4 | 3829.8 | 3860.8 |
| Quadratic change | 0.2 | 1 | 0.65 | -1910.8 | 5 | 3831.6 | 3870.3 |
| Individual random slopes | 7.1 | 1 | 0.0079 | -1907.4 | 5 | 3824.7 | 3863.5 |

The final model included individual and school-level random intercepts, and linear change in the fixed effects. Random slopes at the individual level improved fit in the unconditional model but the conditional model failed to converge so the random slopes term was dropped.

**Table A11: Multilevel model for heavy episodic drinking (unadjusted)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| n = 6378 | b | z | OR | p |
| Time | 2.26 (1.75 to 2.78) | 8.65 | 9.63 (5.76 to 16.09) | < 0.0001 |
| Climate | 1.17 (0.16 to 2.19) | 2.26 | 3.23 (1.17 to 8.95) | 0.024 |
| Climate × Time | -0.72 (-1.34 to -0.11) | -2.30 | 0.49 (0.26 to 0.90) | 0.022 |
| Intercept | -8.49 (-9.50 to -7.49) | -16.58 | . | < 0.0001 |
| Var(Intercept [Schools]) | 2.77 (1.30 to 4.24) | 3.69 | . | 0.00023 |
| Var(Intercept [Individuals]) | 7.61 (5.63 to 9.58) | 7.54 | . | < 0.0001 |

**Table A12: Multilevel model for heavy episodic drinking (adjusted)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| n = 6021 | b | z | OR | p |
| Time | 2.30 (1.77 to 2.83) | 8.52 | 10.01 (5.89 to 16.99) | < 0.0001 |
| Climate | 0.98 (0.05 to 1.92) | 2.07 | 2.67 (1.05 to 6.80) | 0.039 |
| Climate × Time | -0.70 (-1.34 to -0.07) | -2.17 | 0.50 (0.26 to 0.94) | 0.030 |
| Female | -0.72 (-1.11 to -0.33) | -3.63 | 0.49 (0.33 to 0.72) | 0.00028 |
| School type: Private | -0.31 (-1.28 to 0.65) | -0.64 | 0.73 (0.28 to 1.91) | 0.52 |
| School type: Catholic | 0.20 (-0.90 to 1.30) | 0.35 | 1.22 (0.41 to 3.65) | 0.73 |
| Any truancy | 1.97 (1.53 to 2.41) | 8.73 | 7.17 (4.61 to 11.16) | < 0.0001 |
| Depression | 0.92 (0.37 to 1.47) | 3.30 | 2.51 (1.45 to 4.34) | 0.00096 |
| Anxiety | 0.90 (0.30 to 1.50) | 2.93 | 2.45 (1.35 to 4.46) | 0.0033 |
| Intercept | -8.28 (-9.35 to -7.20) | -15.08 | . | < 0.0001 |
| Var(Intercept [Schools]) | 1.98 (0.89 to 3.07) | 3.57 | . | 0.00036 |
| Var(Intercept [Individuals]) | 6.28 (4.60 to 7.95) | 7.34 | . | < 0.0001 |

**Table A13: Fit statistics for unconditional models of alcohol-related harm**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Model | LRT χ² | LRT df | LRT p | log-likelihood | df | AIC | BIC |
| Intercept only | . | . | . | -4172.9 | 1 | 8347.9 | 8355.6 |
| Individual random intercepts | 861.9 | 1 | < 0.0001 | -3742.0 | 2 | 7487.9 | 7503.4 |
| Individual and school random intercepts | 269.6 | 1 | < 0.0001 | -3607.2 | 3 | 7220.3 | 7243.5 |
| Linear change | 129.4 | 1 | < 0.0001 | -3542.4 | 4 | 7092.9 | 7123.8 |
| Quadratic change | 0.0 | 1 | 0.97 | -3542.4 | 5 | 7094.9 | 7133.6 |
| Random slopes | 13.7 | 1 | 0.00021 | -3535.6 | 5 | 7081.2 | 7119.9 |
| Correlated random intercepts and slopes | 5.6 | 1 | 0.018 | -3532.8 | 6 | 7077.5 | 7124.0 |

The best fitting model included linear change over time only. The random effects structure included random intercepts at the school level, and random intercepts and slopes at the individual level. Allowing for correlation between random intercepts and slopes at the individual level improved fit in the unconditional model but failed to converge in the conditional models.

**Table A14: Multilevel model for alcohol-related harm (unadjusted)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| n = 6371 | b | z | OR | p |
| Time | 0.87 (0.37 to 1.38) | 3.38 | 2.40 (1.44 to 3.98) | 0.00072 |
| Climate | 0.87 (0.10 to 1.65) | 2.21 | 2.40 (1.10 to 5.20) | 0.027 |
| Climate × Time | -0.31 (-0.76 to 0.13) | -1.37 | 0.73 (0.47 to 1.14) | 0.17 |
| Intercept | -6.14 (-6.82 to -5.45) | -17.56 | . | < 0.0001 |
| Var(Intercept [Schools]) | 1.99 (1.09 to 2.90) | 4.32 | . | < 0.0001 |
| Var(Time [Individuals]) | 2.67 (0.41 to 4.93) | 2.32 | . | 0.021 |
| Var(Intercept [Individuals]) | 7.45 (5.86 to 9.04) | 9.19 | . | < 0.0001 |

**Table A15: Multilevel model for alcohol-related harm (adjusted)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| n = 6020 | b | z | OR | p |
| Time | 0.70 (0.20 to 1.21) | 2.72 | 2.02 (1.22 to 3.34) | 0.0064 |
| Climate | 0.65 (-0.10 to 1.39) | 1.71 | 1.91 (0.91 to 4.01) | 0.088 |
| Climate × Time | -0.31 (-0.78 to 0.16) | -1.28 | 0.73 (0.46 to 1.18) | 0.20 |
| Female | -0.66 (-0.97 to -0.35) | -4.15 | 0.52 (0.38 to 0.70) | < 0.0001 |
| School type: Private | -0.18 (-0.99 to 0.64) | -0.43 | 0.84 (0.37 to 1.89) | 0.67 |
| School type: Catholic | 0.03 (-0.92 to 0.99) | 0.07 | 1.03 (0.40 to 2.69) | 0.95 |
| Any truancy | 2.04 (1.65 to 2.44) | 10.12 | 7.70 (5.18 to 11.43) | < 0.0001 |
| Depression | 1.52 (1.07 to 1.96) | 6.69 | 4.55 (2.92 to 7.10) | < 0.0001 |
| Anxiety | 0.94 (0.46 to 1.42) | 3.82 | 2.56 (1.58 to 4.14) | 0.00013 |
| Intercept | -6.20 (-7.00 to -5.40) | -15.26 | . | < 0.0001 |
| Var(Intercept [Schools]) | 1.64 (0.87 to 2.40) | 4.20 | . | < 0.0001 |
| Var(Time [Individuals]) | 3.77 (1.54 to 6.01) | 3.31 | . | 0.00092 |
| Var(Intercept [Individuals]) | 6.11 (4.72 to 7.50) | 8.64 | . | < 0.0001 |

**Table A16: Fit statistics for unconditional models of cannabis use**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Model | LRT χ² | LRT df | LRT p | log-likelihood | df | AIC | BIC |
| Intercept only | . | . | . | -1148.0 | 1 | 2297.9 | 2305.2 |
| Individual random intercepts | 135.3 | 1 | < 0.0001 | -1080.3 | 2 | 2164.6 | 2179.3 |
| Individual and school random intercepts | 111.4 | 1 | < 0.0001 | -1024.6 | 3 | 2055.2 | 2077.1 |
| Linear change | 85.8 | 1 | < 0.0001 | -981.7 | 4 | 1971.4 | 2000.7 |
| Quadratic change | 5.5 | 1 | 0.019 | -978.9 | 5 | 1967.9 | 2004.4 |
| Individual random slopes | 2.3 | 1 | 0.13 | -977.8 | 6 | 1967.6 | 2011.4 |

The final model included random intercepts at the individual and school levels, and quadratic change in the fixed effects.

**Table A17: Multilevel model for cannabis use (unadjusted)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| n = 4139 | b | z | OR | p |
| Time | 3.82 (1.60 to 6.03) | 3.38 | 45.38 (4.96 to 415.04) | 0.00073 |
| Time² | -1.52 (-3.41 to 0.37) | -1.58 | 0.22 (0.03 to 1.44) | 0.11 |
| Climate | 0.67 (-0.61 to 1.94) | 1.02 | 1.94 (0.54 to 6.97) | 0.31 |
| Climate × Time | -0.19 (-3.37 to 2.99) | -0.12 | 0.82 (0.03 to 19.85) | 0.91 |
| Climate × Time² | -0.38 (-3.15 to 2.40) | -0.27 | 0.69 (0.04 to 11.00) | 0.79 |
| Intercept | -8.25 (-9.50 to -7.01) | -12.98 | . | < 0.0001 |
| Var(Intercept [Schools]) | 2.32 (0.79 to 3.85) | 2.97 | . | 0.0030 |
| Var(Intercept [Individuals]) | 5.62 (3.44 to 7.80) | 5.05 | . | < 0.0001 |

**Table A18: Multilevel model for cannabis use (adjusted)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| n = 3920 | b | z | OR | p |
| Time | 4.53 (2.19 to 6.87) | 3.80 | 92.94 (8.95 to 965.20) | 0.00015 |
| Time² | -2.20 (-4.18 to -0.21) | -2.17 | 0.11 (0.02 to 0.81) | 0.030 |
| Climate | 0.58 (-0.64 to 1.79) | 0.93 | 1.78 (0.53 to 5.99) | 0.35 |
| Climate × Time | -0.79 (-4.10 to 2.51) | -0.47 | 0.45 (0.02 to 12.35) | 0.64 |
| Climate × Time² | 0.26 (-2.60 to 3.13) | 0.18 | 1.30 (0.07 to 22.80) | 0.86 |
| Female | -1.34 (-1.88 to -0.81) | -4.92 | 0.26 (0.15 to 0.45) | < 0.0001 |
| School type: Private | 0.60 (-0.49 to 1.68) | 1.08 | 1.82 (0.61 to 5.38) | 0.28 |
| School type: Catholic | 0.98 (-0.21 to 2.18) | 1.61 | 2.66 (0.81 to 8.80) | 0.11 |
| Any truancy | 1.56 (1.00 to 2.13) | 5.42 | 4.76 (2.71 to 8.38) | < 0.0001 |
| Depression | 0.67 (-0.07 to 1.42) | 1.78 | 1.96 (0.93 to 4.12) | 0.075 |
| Anxiety | 0.92 (0.11 to 1.72) | 2.23 | 2.50 (1.12 to 5.61) | 0.026 |
| Intercept | -8.32 (-9.81 to -6.83) | -10.92 | . | < 0.0001 |
| Var(Intercept [Schools]) | 1.52 (0.44 to 2.61) | 2.76 | . | 0.0058 |
| Var(Intercept [Individuals]) | 4.79 (2.82 to 6.76) | 4.76 | . | < 0.0001 |

**References**

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