

question scale, which was split into physical and mental subcomponents.

RESULTS: 60.4% of students met the WHO recommended PA guidelines. Men reported significantly higher total weekly PA than women (4266 vs. 2679 MET-min/week), which was characterised by a significantly higher weekly moderate and vigorous intensity PA ($p < 0.001$). Men reported significantly higher total HRQoL compared to women (78.4 vs. 76.8 units) and the highest scoring HRQoL domain was the role of physical limitations for men (95.9) & women (95.1). Physical activity intensity positively correlated with total HRQoL score for both men & women ($p < 0.001$). No correlation was found between sedentary behaviour & HRQoL. A high level of PA significantly predicted total HRQoL when performing separate gender analysis for men (Odds Ratio [95% CI]; 1.03 [1.00-1.05], $p < 0.05$) & women (Odds Ratio [95% CI]; 1.03 [1.01-1.05], $p < 0.01$).

CONCLUSIONS: This University cohort of students, present with high levels of PA and perceived HRQoL compared to previous literature. The relationship between PA and HRQoL is a dose-dependent response, with students participating in higher levels of PA presenting with the highest HRQoL score. Yet, 39.6% of students did not meet PA guidelines, and 28.5% spent 10 or more hours sitting. University health services should strive to promote higher levels of PA. Furthermore, targeted programs reducing sitting time, will benefit the overall health and well-being, particularly in the current study cohort.

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The Impact Of Air Pollution On Heart Rates And Rpe Scales Among Chinese University Students

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PURPOSE: The purpose of this study was to assess the impact of air pollution on heart rates (HR) and the Borg rating of perceived exertion (RPE) scale during outdoor physical education (PE) class.

METHODS: 34 male (Age=18.64±1.15 yr.; Height = 175.76±6.56 cm; Weight = 73.58±12.76 kg; BMI = 23.88±4.49 kg/m²) Chinese college students were measured HR and RPE during outdoor the same PE class in the same samples at different air quality Index (AQI). All subjects performed the same PE class during different air quality (one class was performed with AQI at 49 vs another class was performed with AQI at 230). We used Polar team2 to monitor HR and the RPE scale to measure perceived exertion during PE class. The data were analyzed using paired t-test.

RESULTS: With AQI at 49, the mean subjects' RPE was 3.87 scores (ranging from 1.79 to 4.71 scores), and HR was 123.73 bpm, respectively. With AQI at 230, the mean subjects' RPE was 3.93 scores (ranging from 1.74 to 4.97 scores), and HR was 125.18 bpm, respectively. Air pollution has led to HR_{min} increase by 5.97% (6.99%↑, 95% CI = 0.473, 11.468) ($p < 0.001$).

CONCLUSION: Air pollution may lead to the subjects' average HR increase during the same PE class. It is suggested to incorporate HR zone into the evaluation of physiological changes in air pollution in future studies.

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Do New Zealand Adolescents Adhere To Activity Guidelines? A 24-h Time-use Study

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The New Zealand (NZ) Ministry of Health has adopted a holistic approach to activity guidelines for youth, incorporating all physical behaviours (sleep, sedentary behaviour and light to vigorous physical activity) into the 24-h recommendations. However, literature on compliance with all aspects of these guidelines in NZ adolescents is lacking.

PURPOSE: To measure 24-h physical behaviours and evaluate compliance with NZ activity guidelines in a sample of NZ adolescents.

METHODS: Physical behaviours were assessed over seven consecutive days in 144 healthy adolescents in the Auckland region of NZ (mean±SD age: 14.7±1.6y, 58% female) using a thigh-worn accelerometer. Self-reported sleep, screentime and physical activity were also assessed using a diary. Seven components of the guidelines were assessed: sleep duration, consistent bedtimes, recreational screentime, moderate-to-vigorous physical activity (MVPA), light physical activity (LPA), vigorous physical activities (VPA) and activities which strengthen bone and muscle. Average time spent per day in MVPA, LPA and recreational screentime were also determined.

RESULTS: The median number of guideline components met was 1/7, with 1% (n=1) of participants concurrently meeting all seven components. Of all participants, 3% performed ≥ 1h/day of MVPA; 13% performed several (>2) hours per day of LPA; 15% spent <2h/day in recreational screentime; 47% achieved the recommended sleep duration for their age; 6% had consistent bed and wake-up times (time range ≤ 1h); 35% performed some VPA on ≥3 days out of seven, and 26% performed some bone and muscle strengthening activities on ≥3 days out of seven. Adolescents spent an average of 0.5h/day in MVPA, 1.5h/day in LPA and 4.6h/day in recreational screentime.

CONCLUSIONS: Overall, adolescents in NZ are not meeting activity guidelines. This study highlights the need to identify strategies to increase time spent in physical activity of all intensities and reduce sedentary behaviour in this age group. Supported by Maurice and Phyllis Paykel Trust and Lottery Health Research grants.

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Exercise Behavior And Recreational Sport Participation Predict Academic Success And Graduation In University Students

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Most universities offer fitness and recreational opportunities. Few prospective studies have measured the effect of those services on academic outcomes.

PURPOSE: To evaluate the effect of exercise behavior and recreational sport participation on student success.

METHODS: We tracked 1,506 students at a private D1 university for 4 years. Upon completion of the 2017-2018 academic year, we exported a registry of every undergraduate student who accessed the university fitness center. We documented whether they participated in club sports (CS), intramural sports (IS), group exercise classes (GEC), or special activity classes (SAC), as well as the frequency of visits to the facility; these served as independent variables. We also recorded grade point average (GPA) and whether the students had graduated upon completion of the 2021-2022 academic year; these served as dependent variables. Independent-samples t-

tests and chi-squared tests measured group differences in academic outcomes. Linear and logistic regressions tested the effects of combinations of independent variables on GPA and graduation respectively.

RESULTS: 9.6% of students participated in CS, 7.4% participated in IS, 8.9% participated in GEC, and 3.3% participated in SAC. Mean GPA was 3.1 ± 0.6 and 75.7% successfully graduated. Significant and trending elevations of GPA were observed in students who participated in GEC ($p < 0.001$; 95% CI: 0.2 to 0.4) and CS ($p = 0.072$; 95% CI: -0.0 to 0.2). Graduation rate was 10.8 percentage points higher in students who participated in IS ($p = 0.010$) and 23.1 points higher in SAC participants ($p < 0.001$). Linear regression predicting GPA included 4 significant and trending predictors: sex ($\beta = 0.163$; $p < 0.001$), CS participation ($\beta = 0.093$; $p = 0.063$), GEC participation ($\beta = 0.187$; $p < 0.001$), and number of visits to the fitness facility ($\beta = 0.004$; $p < 0.001$). Logistic regression for graduation included 4 significant and trending predictors: sex (OR=1.253; $p = 0.070$), IS participation (OR=2.131; $p = 0.007$), SAC participation (OR=15.491; $p = 0.007$), and number of facility visits (OR=1.008; $p = 0.020$).

CONCLUSIONS: Increased involvement in exercise and recreational sports associated with a higher GPA and increased odds of graduation. Administrative emphasis of fitness programming may be an effective way to enhance student success.

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Relationship Between Youth Daily Physical Activity And Video Game Play On Body Mass Index

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Consumer reports indicate that 71% of Americans under the age of 18 play video games (VG). The average youth VG player accumulates 13 hours per week in VG-related sedentary behavior, which can contribute to poor health outcomes.

PURPOSE: The purpose of this study was to investigate the relationship between physical activity (PA) and VG time on body mass index (BMI) in children from a nationally representative sample in the US.

METHODS: Data were analyzed from the 2012 National Youth Fitness Survey (NYFS). Participants included 1,477 children aged 3-15 years who wore an Actigraph GT3X+ physical activity monitor on their wrist for seven days, measured body mass index (BMI), and completed a physical activity questionnaire. A subsample was analyzed after excluding for valid wear time and PA questionnaire responses to VG participation. Daily averages for monitor-independent movement summaries (MIMS) were calculated and participants were split into quartiles (<16149, 16149-18506, 18506-20996, and >20996 MIMS/day). Self-reported average daily minutes playing VG on computer or console were split into quartiles (<45, 45-90, 90-120, and >120 min/day). A two-way ANOVA with post-hoc analysis was performed on MIMS per day quartiles and VG min per day quartiles with BMI score (kg/m^2) and classification (CDC recommended percentiles).

RESULTS: A sample of 419 children (male=251, female=168) with an average BMI 20.2 ± 5.0 met analysis criteria. There was a statistically significant interaction between VG time and PA on BMI score ($F = 4.946$ and $p < 0.001$) and BMI classification ($F = 4.085$ and $p < 0.001$). Post-hoc analysis identified a statistically significant protection against increases in BMI scores and classification for the two highest PA quartiles, independent of time spent playing video games. Specifically, averaging at least 18506 MIMS/day when accumulating 120+ min/day in VG was protective against increases in BMI ($p = 0.12$). Alternatively, children in the second lowest PA quartile were most influenced by VG time with a non-statistically significant dose-response relationship ($p = 0.177$).

CONCLUSIONS: These results highlight the protective benefits of daily PA in children that play VG and suggest a subgroup of children experiencing a dose-response relationship between VG time and BMI.

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Predictors For Latent Musculoskeletal Fitness Profiles In U.s. Youth

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PURPOSE: Musculoskeletal fitness (MSF) is an important yet understudied predictor of health among youth. Prior research has focused on separate domains of MSF, without identifying homogenous profiles that relate to health indicators, such as weight status, and health behaviors, such as physical activity (PA). Thus, we used latent profile analysis to identify MSF profiles, and evaluated whether sex, weight status, and PA predicted membership in each profile.

METHODS: Data came from the NHANES National Youth Fitness Survey for ages 12-15 years. Z-scores for the following variables were used to create latent MSF profiles: modified pull-up, leg extension, grip strength, and plank hold test. Model fit comparisons were made for 2-, 3-, 4- and 5- profile models. Multinomial logistic regression models controlling for age (yrs) were used to predict membership in a MSF profile. Predictor variables were: weight status (underweight, healthy, overweight, obese), whether they self-reported 60 or more minutes of PA per day (meeting PA guidelines, yes/no), and sex (M vs. F). Results are reported as odds ratios with 95% confidence intervals.

RESULTS: Fit statistics were optimal for a 3-profile model: Profile 1: *Low overall MSF*, Profile 2: *Above average MSF*, and Profile 3: *High upper body/core MSF*.

Participants in Profile 2 were 0.47 (0.25, 0.90) times as likely to have overweight and 0.18 (0.09, 0.36) times as likely to have obesity compared to Profile 1.

Participants in Profile 2 were 0.17 (0.10, 0.28) times as likely to be female and 2.14 (1.25, 3.64) times as likely to meet PA guidelines than those in Profile 1.

Participants in Profile 3 were 0.29 (0.11, 0.78) times as likely to have overweight and 0.02 (0.01, 0.13) times as likely to have obesity than those on Profile 1.

Participants in Profile 3 were 0.04 (0.01, 0.10) times as likely to be female and 5.98 (1.96, 18.28) times more likely to meet PA guidelines than those in Profile 1.

CONCLUSIONS: Sex, weight status, and PA predicted membership in 3 different latent MSF profiles among youth. Interventions to increase MSF should target females and those with overweight and obesity as they are more likely to have low overall MSF. Modifiable behaviors such as increased PA may be appropriate for improving MSF among youth.

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A Framework Combining Prior Research, Stakeholder Feedback, And Observations To Inform Classroom And Schoolyard Redesign

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