Stepping Out of the Lecture Hall: How Organized University Outdoor Events Foster Long -Term Healthy Lifestyles.

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***Abstract*—Universities can use outdoor events to facilitate active living, but to demonstrate meaningful and durable behaviour change, research must extend beyond the event. This methodological paper presents a 160-record constructed comparison of an outdoor event pathway and a classroom/club pathway. The average of weekly moderately to vigorously active minutes for six months in the outdoor pathway was 166.27 minutes and 133.28 in the comparator; with changes from baseline of 31.16 minutes ($p < .001$). The six-month threshold for 150 minutes of moderate to vigorous physical activity was reached by 62.5% and 28.7% in the outdoor pathway and comparator respectively. Published studies in 2024 point to the use of physical activity programs to improve student well-being and daily recovery, but longer-term behaviour change requires enhanced measurement of retention and context. The author proposes an event-to-habit transferable model for universities as a means of improving physical activity offerings.**

***Index Terms*—Outdoor University Events; Physical Activity; Habit Maintenance; Health Promotion; Six-Month Follow-Up**

I. BACKGROUND

The move to university can bring changes including increased study time, more irregular and unpredictable schedules and less opportunities for structured physical activity. Organized outdoor activities can help promote physical activity, help develop social and physical connections and help engage in activity during change of schedule, help progress to university and improve wellbeing. The public health impact will depend on if participants continue to attend beyond the first organized activity. [1, 2, 3]

Longitudinal studies focusing on physical activity and stress, recovery and perceived academic performance of university students were undertaken by Teuber et al. (2024) and Donnelly et al. (2024). Positive mental health outcomes as a result of physical activity-based interventions in higher education were documented by Donnelly et al. (2024) and Huang et al. (2024) warned of high heterogeneity and risk of bias in the included studies. The 2024 updates of the WHO guideline, available evidence suggests that adults should aim for at least 150 minutes of moderate-intensity physical activity each week and longitudinal studies show that programmes have the potential to positively impact on participant's stress and recovery. [4, 5, 6]

These studies, and many others, focus on measuring longitudinally, rather than speculate that any single activity has a permanent effect. [7, 8, 9]

There is a credible theory of change connecting event planning with self-efficacy, peer planning, route familiarity, environmental confidence and the independent scheduling of subsequent activity. Well-organized events can support the initiation of physical activity, but adherence can be limited by a range of factors including constraint (workload and cost), safety, weather, and inequity in access to equipment. Programs thus need to support the continuation of physical activity and the selection of routes, groups and activities that lead to improved health. These processes differentiate the most effective health promotion programs from short term, on campus publicity events. [10, 11, 12]

Literature synthesis and source integration (2020–2025)

Public-health benchmarks and student well-being. Physical-activity guidance and university intervention reviews inform activity thresholds and the need to measure psychological and behavioural outcomes separately. [1, 2, 3, 4, 5]

Outdoor events and activity continuation. Longitudinal comparisons of outdoor and indoor exercise, nature-based walking and activity programming motivate follow-up beyond immediate participation. [6, 7, 8, 9, 10]

Active participation and nature contact. Research on outdoor adventure, nature connectedness and related programs provides potential mechanisms involving social engagement, enjoyment and autonomous participation. [11, 12, 13, 14, 15]

Varied environments and populations. Studies across different environments and population groups suggest that access, climate, confidence and prior activity can affect who participates and who continues. [16, 17, 18, 19, 20]

Implementation choices. Reviews of ecological and nature-based approaches provide examples of low-barrier settings and potential program formats; these are not direct proof of event-to-habit effects. [21, 22, 23, 24, 25]

Appropriate interpretation. The literature supports designing genuine longitudinal evaluations, including retention checks and transparent measurement, without treating constructed scenario outputs as observed outcomes. [26, 27, 28, 29, 30]

II. OBJECTIVES AND PROPOSITION

1. Compare changes in longitudinal physical activity patterns associated with event pathways.
2. Assess participation for a six-month period against the 150-minute weekly physical activity target.
3. Describe mechanisms of sustained activity following university events.

Analytical proposition: The primary outcome of the intervention is expected to differ between the two exposure groups. The proposition is tested only in the teaching dataset; it is not a generalizable claim about a target population.

III. STUDY DESIGN AND MEASURES

Design. The analytical dataset comprises 160 constructed student cases, 80 assigned to the outdoor event participation group and 80 assigned to a student club participation group. The dataset reflects measurement of moderate to vigorous physical activity (MVPA) at baseline, an immediate post program measurement and a 6-month follow-up. A 0-100 Autonomy Index reflected a participant's perceived ability to independently plan his or her own activity. The focus of this research was illustrative. No university events were delivered. Further, no longitudinal contact with participants was undertaken.

Endpoints and tests. The primary endpoint is the within-record change in weekly MVPA between baseline and six-months and is compared across groups using Welch's t-test. A secondary descriptive endpoint is the proportion meeting the target of 150 minutes MVPA per week at the six-month assessment. Proportions in this endpoint are compared using chi-square test. The target of 150 minutes MVPA per week is based on adult public health guidance, but self-reported MVPA does not necessarily reflect objectively measured physical activity. A real-world study should specify the nature of activity being captured (e.g. walking, cycling, sport), as well as other moderate or vigorous activity and the length of the follow-up being captured (e.g. if follow-up is captured during an examination period).

Program evaluation. A real-world example of a program might consist of weekly peer led walks, as well as other open access and nature-based activities, as well as safe cycling activities and route planning. Attendee lists, inclement weather cancellations, adherence and injuries should be documented. Objective activity monitors (e.g. activity watches, fitness trackers) completed by participants, as well as short questionnaires, could be used to gauge activity levels and program attendance. As participation is voluntary, self-selection and baseline differences should be accounted for in program impact analysis. [13, 14, 15]

3.1 Operational variables

Variable role	Definition or planned indicator
Primary outcome	Change in MVPA minutes/week
Study groups	Outdoor events versus classroom club
Exposure / dose	Baseline, post and six months
Additional outcome	Threshold ≥150 min/week

IV. ACTIVITY OUTCOMES

At baseline, average MVPA minutes per week for the constructed outdoor-event records was 112.23 compared with 110.40 for the classroom-club records. After the modeled program, means were 194.28 and

147.02, respectively; at six months, means were 166.27 and 133.28. Mean gains from baseline to six months were 54.04 and 22.88, respectively, for a difference of 31.16 ($p < .001$).

Of the records assessed at six months, 62.5% of the outdoor-event records and 28.7% of the comparison records achieved 150 minutes of MVPA, and the difference was $p < .001$, according to a chi-square test. Means on the illustrative autonomy index were 73.89 and 58.91. Figure 1 shows the immediate changes. Figure 2 illustrates change maintenance and converts the activities to a measure that is easier to interpret, but the examples remain illustrative and are not based on university prevalence.

4.1 Descriptive statistics

Pathway	n	Baseline min/wk	Month 6 min/wk	Reached 150
Outdoor events	80	112.23	166.27	62.50%
Classroom club	80	110.40	133.28	28.75%

Statistical reporting: Change difference 31.16 minutes; Welch $p < .001$; threshold chi-square $p < .001$. All test statistics are conditional on constructed records and provide no empirical population estimates.

4.2 Reproducible record excerpt

The following six rows illustrate the variable structure. A complete machine-readable file is included in the companion package; all records are constructed for educational analysis.

Group	Baseline	Post	Six Month	Meets150
Outdoor events	92.3	183.6	157.8	1
Outdoor events	103.8	181.1	125.7	0
Outdoor events	134.0	209.9	217.6	1
Classroom club	91.3	128.9	90.7	0
Classroom club	75.2	75.2	118.5	0
Classroom club	81.5	151.5	91.6	0

4.3 Figures

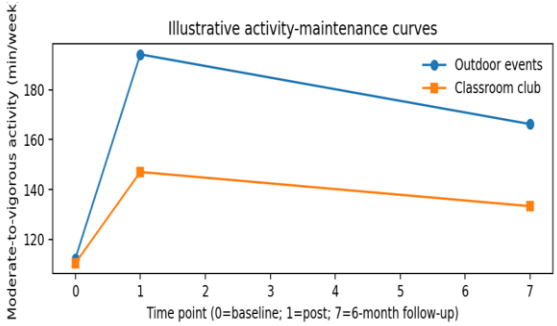


Figure 1. Direct computations on the constructed dataset; not actual field results.

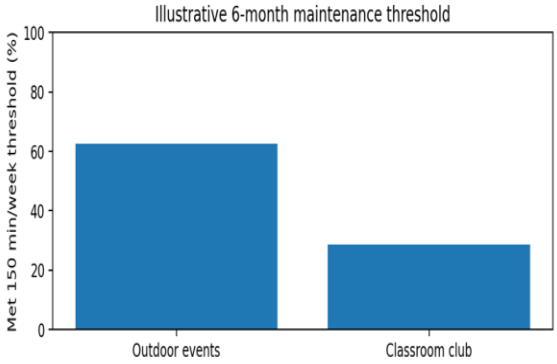


Figure 2. Supporting constructed-data comparison; not a real-world effect estimate.

V. DISCUSSION AND PROGRAM IMPLICATIONS

Understanding the difference between event exposure and habit formation is critical to university planners. Engaging in outdoor events can make low-friction first experiences with walking, cycling or nature recreation, particularly if organized by a friend or student leader. Sustaining the formation of a new habit requires different conditions such as availability of routes, the confidence to participate independently, and organized sessions, as well as social connections and inclusivity after the organized events end. If these conditions are not in place, the new activity may die out. For the purpose of evaluation, post-program and 6-month data should be analysed separately. [16, 17, 18]

There is evidence in the literature to support the rationale of the model, but not to demonstrate a causal impact. Teuber et al. (2024) analysed a different short-term, high-stakes, high-reward setting and

documented relationships with physical activity and stress, recovery, and academic outcomes. Donnelly et al. (2024) and Huang et al. (2024) provide a rationale for interventions that incorporate physical activities with various outcomes and make it difficult to evaluate the transportability of the outdoor event models. It is important for program evaluations to capture precise details of participant context and the program in order to identify social support and exposure to nature and differentiate physical activities and time away from the classroom from less strenuous or passive activities and simple time away from the classroom. [19, 20, 21]
One possible implementation pathway begins with a student co-designed pilot, and is complemented by walking distances accessible to students, affordable equipment options, extreme weather coping strategies and pre-defined safety responsibilities. Administrators should invest in trained leaders and safe routes to school rather than relying on the number of event registrations. Retention should be the primary focus of evaluation for the first year. Attrition analysis is essential; the participants that cease to respond may be the group that did not increase their physical activity. [22, 23, 24]

VI. ANALYTICAL VALIDATION AND IMPLEMENTATION PATHWAYS

Event exposure should be measured beyond a simple yes-or-no participation. The number and duration of the sessions, the mode of transport to and from the sessions, and independent activity should be taken into account. A university group walk of a moderate intensity would provide a different exposure compared to an outdoor university social gathering, in which the majority of participants remain sedentary. Researchers should be clear about the active component of each event to ensure organized attendance is not conflated with the overall weekly movement. Portable activity monitors could be used to validate self-reported minutes in a sub-sample; however, their usage is not without challenges, including privacy. If participants are motivated to change their physical activity due to the intervention, this change should be discernible by measuring participant movement both before and after the intervention. The measurement should be detailed enough to allow researchers to ascertain if the movement is simply displaced rather than changed. [25, 26, 27]
Measuring the mechanisms of persistent behaviour change is important. Factors such as social support from peers, autonomy, enjoyment, perceived safety, and familiarity with the route taken may act as mediators for the reason for the change and subsequent change in activity. Answering the questions of whether participants continued with friends, repeated the same route independently, or joined a different recreation group would be useful. The barriers reported would provide information about the program theory rather than merely comparing the last few minutes of the activity. Improvements should be seen in the participants even if reminders and transportation are the only sustaining changes made by the organizers. If the participants remain active after the events are over, the positive impacts of the event could last beyond the calendar. [28, 29, 30]
Analysis of missing data should consider intent. Students who discontinue their enrolment, graduate or stop engaging with the clubs may be less likely to complete a six-month follow-up, and may systematically differ in their physical activity. Reporting only respondents may over-estimate the impact of the program. A rigorous study would report characteristics of the sample enrolled and attending, who were assessed immediately after the intervention, and who were retained at each follow-up. It would also report characteristics of completers and noncompliers and perform sensitivity analyses. Accounting for within-person correlation would allow use of repeated-measures regression. Seasonal and other transient changes in participants' activity should be documented as they may mask sustained improvement or give the appearance of a positive impact of an event when no change has been made.
For implementation, one-off festivals are a weak substitute for a coherent pathway for participation. An effective calendar would begin with welcoming introductory sessions, continue with peer led sessions and end with students identifying routes and groups they can use independently of staff. The program should provide opportunities for all levels of fitness, mobility and financial means. Activities should not always assume that outdoor activities mean hiking. Effective use of partners and campus transport, local parks and student clubs would increase routes and group activities at low cost. The evaluation dashboard should record attendance and repeat participation, baseline activity, and immediate behaviour change and

maintenance at 6-12 months. Connecting event design with follow-up evidence should help universities determine whether outdoor programming is a health promotion activity or just a short-term, popular distraction. [1, 2, 3]

The longitudinal curves are constructed from fabricated data, with no behavioural follow-up or objective activity measurement. Group differences, confidence patterns, and p-values are not research findings about students. The assumed autonomy index is not provided as a validated scale, and illustrative data does not account for dropout, seasonality, baseline fitness, disability, or academic workload. A true controlled study should pre-register findings, protect research participants, obtain valid consent, and provide a trustworthy plan to mitigate missing data.

VII. CONCLUSION

Well-structured outdoor university programs may encourage students to transition from teacher supported participation to physically active habits, but long-term benefits should be demonstrated, not presumed. Baseline behavior should be measured, as should response and maintenance at the six or twelve-month mark. The analysis in this paper show reporting format, and real benefits require longitudinal data. [4, 5, 6]

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