

Examining the impact of a leisure time intervention on participation in organized out-of-school activities among adolescents: a quasi-experimental study in Franklin County, KY, USA

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Abstract

Guided by the Icelandic Prevention Model, a community-led coalition in Franklin County, KY, aimed to subsidize costs for participation in supervised organized leisure time programs among its youth via adaptation of the Reykjavik City Leisure Card program, locally known as the ‘YES Card’ voucher program. This study examined whether the proportion of students participating in supervised out-of-school activities and sports was higher in the YES Card intervention group compared to a similar group of youth who did not receive the voucher across two time points. Two waves of survey data were collected in one intervention middle school and two geographically and demographically similar comparison schools in 2020 (n for intervention = 112, n for comparison = 723) and 2021 (n for intervention = 134, n for comparison = 873). The expected age of students ranged between 12 and 15 years. Analyses were conducted using logistic regression. The YES Card receivers were two-and-a-half times more likely to participate in nonsport organized recreational activities [odds ratio, OR, 2.43 (95% confidence interval, CI, 1.07–5.52)] and almost twice as

likely to participate in sports [OR: 1.91 (95% CI: 1.08–3.38)] over the 1-year study period, compared to non-YES Card youth. We conclude that Franklin County in KY in the USA has successfully adapted the Reykjavik City Leisure time voucher program.

Introduction

The use of substances by young people is a global concern. The effects of alcohol, tobacco and other drug (ATOD) use can manifest as detrimental health, developmental and social consequences in both the short and long term. A recent European burden of disease study reported that while prevalence of substance use disorders (SUDs) has declined among young people (defined as 10- to 24-year-old) in Europe, the number of years lived with disability associated with SUDs has increased at the same time [1]. Furthermore, latest estimates from the Pan American Health Organization indicate that years of life lost to SUDs increased between 2015 and 2019 among 15- to 19-year-olds in both Canada and the USA [2]. Because adolescence is a critical time period in which substance use initiation is most likely to occur, there is an

urgent need for effective population-based primary prevention intervention strategies that reduce use overall and delay the onset of ATOD use in this demographic.

During the first two decades of the 21st century, Iceland witnessed some of the most dramatic reductions in youth substance use in the Western World. Evidenced by both international comparative studies and routine local surveys [3, 4], part of this trend can be attributed to efforts related to the Icelandic Prevention Model (IPM) [4–7]. Origins of the IPM can be traced back to the establishment of the 1997 governmental initiative ‘Drug Free Iceland 2002’, which laid the foundation for a collaborative system in primary adolescent substance use prevention where routine survey data collection in schools was applied to inform policy, practice and interventions at the local, municipal and national levels, building on the municipal and school–community organizational structure in Iceland [8]. At its theoretical core, the model assumes that youth who grow up and develop in an environment where they are well-supported by their parents/caregivers and family, have friends to spend time with that are not engaging in substance use, enjoy going to school where they are supported and nurtured and have opportunities to participation in positive, character-building and prosocial leisure time activities are much less likely to engage in substance use early in their lives, compared to youth where some or all of these functions are lacking [6, 9].

In line with the leisure time assumptions of the model, the City of Reykjavik in Iceland began to offer a prepaid leisure card voucher for youth residents, aged 6–18 years in the year 2007 [10]. The voucher program, one of several primary prevention strategies borne from the model, is an annually renewed electronic check (2022 equivalent of ~\$400US Dollars (USD)) attached to each child’s social security number that parents and families can use to enroll them into organized recreational and extracurricular activities. Activity vendors, now totaling over 200, are subject to certain professional standards and need to be approved by the City’s Sport and Recreational Committee. Programs must be organized for a minimum of 8 consecutive weeks

at a time. The objectives of the voucher program are to contribute to the mission of the IPM and to boost participation in organized activities among all youth, irrespective of age, gender, race, religious background and immigration status, particularly among those who otherwise would be less likely to participate in such programs, for example, for cultural or financial reasons. Structured recreational and extracurricular activities can provide opportunities through which adolescents can be reached, influenced and supported in positive ways [7]. Often, this takes place through participation in mentorship or community programs or through relations with influential supervising adults (e.g. teachers or coaches) [11]. During the last 20 years, many studies have found that participation in structured and supervised recreational and extracurricular activities such as sports, music, drama clubs or religious activities decreases the odds of ATOD use and engagement in delinquent peer lifestyle [12–16]. For the sake of brevity, the voucher program has been a success from the start and participation and utility has risen steadily since its inception, with current utility around 80% across all eligible youth cohorts [10]. Furthermore, increased participation in structured and supervised activities continues to be associated with decreased levels of ATOD use among adolescents in Iceland [4, 7, 9].

Other voucher programs aimed at removing financial barriers to activities have resulted in varying degrees of success, e.g. in Australia, Canada and Wales [17–19]. While the focus of these interventions was primarily centered around levels of physical activity, one study of a voucher program tested in Australia titled ‘Active Kids’ measured additional metrics that aligned more closely with the goals of the Reykjavik City Leisure Card and the theoretical assumptions of the IPM. In the case of the Australian voucher program, participation in structured physical activity increased in a 6-month time period, and among those whose activity levels increased (or were maintained), greater levels of self-efficacy, happiness and energy were reported alongside lower levels of loneliness, when compared to counterparts [18].

Franklin county adoption of the IPM and the YES Card

In the fall of 2020, the Franklin County Health Department in KY in the USA (2021 population: 51 682) began to experiment with a localized adaptation of the Reykjavik City Leisure Card voucher system, titled the ‘YES Card’ (individual value = \$400USD per year) as part of their adoption of the IPM. At the onset, the program included seven vendors and has since increased to 27 vendors. In terms of application and eligibility, the principles of the Franklin County YES Card were copied from the Reykjavik City Leisure Card voucher system with one noteworthy difference: the YES Card program has a shorter minimum time requirement of 4 consecutive weeks (partly in response to the SARS-CoV-2 (COVID-19) pandemic) instead of the 8-week requirement by the Reykjavik City Leisure Card program. A standard comparison of the main implementation components of the Reykjavik City Leisure Card and the YES Card pilot project is provided in [Table I](#). The YES Card program is but one of two key strategies undertaken in Frankfort County in the early years of IPM adoption. Another initiative, ‘Parent cafes’, was introduced

to target other IPM theoretical assumptions, such as those around parental/caregiver support and social capital. The purpose of the cafes was two-fold, serving both as a space for parents and caregivers alike to gather and discuss matters related to their children and raising a family and also as a bridge for parents of differing backgrounds, to come together to discuss potential differences (e.g. political views, community matters).

The purpose of this study is to examine whether participation in supervised out-of-school activities and/or organized sports increased in the YES Card intervention group relative to a group of students who did not receive the YES Card intervention in the first 2 years of implementation (2020 and 2021) in Franklin County, KY, USA.

Materials and methods

Sample and procedure

Data from the 2020 and 2021 Planet Youth surveys conducted in Franklin County, KY, USA, were used in this study. The surveys were administered to 12- to 15-year-old students (grades 7–10) between 25 November and 3 January in 2020/2021 ($N = 2401$)

Table I. Comparison of the main components of the Reykjavik City Leisure Card and the Franklin County YES Card Pilot Program

Program	Reykjavik City Leisure Card	Franklin County YES Card Pilot Project
Value	50 000 Icelandic Kronur (~\$400.00USD)/year	\$400.00USD/year
Eligibility criteria	Youth ages 6–18 years with legal residency in the City of Reykjavik	Students in grades 7–10 attending Secondary Street School (expected age: 12–15 years) in Frankfort County, KY, USA
Mode of delivery	Electronic balance automatically applied to social security number of eligible youth on 1 January of each year Redeemable directly through vendors by providing social security number Voucher available until 31 December of the same calendar year	Electronic gift card provided through online debit platform at the beginning of each new school year (August) Redeemable directly through vendors or activity fees reimbursed up to balance of YES Card in cases of prepayment Provided to children of parents who signed up for the pilot through their respective school
Types of activities eligible for voucher system	Supervised sports Supervised nonsport recreational activities	Supervised sports Supervised nonsport recreational activities
Minimum duration of activities	8 consecutive weeks	4 consecutive weeks
Implementing body	City of Reykjavik	Franklin County Health Department

and again between 13 and 24 September 2021 ($N = 2372$). In 2020, all surveys were administered online at home via a secure link. The survey administration period was also extended in 2020 to accommodate students during the implementation period of COVID-19 restrictions such as school closures. In 2021, the surveys were administered in schools as per usual via a secure link. The complete procedure of data collection has been described elsewhere [20]. School-level response rates ranged from 71–92% across all middle schools, which represent the sample for this study.

Franklin County in KY includes three middle schools ($n = 835$). Children in one of the schools (Second Street School; $n = 112$) received the YES Card leisure time intervention beginning in September 2020. Similarly, in 2021, students at Second Street School received the YES Card intervention ($N = 134$), while students in the remaining two schools did not. The YES Card was not provided elsewhere in Franklin County nor elsewhere in KY during this test of the leisure card intervention. This allocation of the YES Card intervention program created the ideal conditions to conduct a retrospective quasi-experimental study. As such, Second Street School students were coded with a 1 (received YES Card) and all remaining students were coded with a 0 (did not receive YES Card). In the final analyses, 246 students were included in the intervention group and 1596 students in the control group across both time points.

The Planet Youth organization (see www.planetyouth.org) assisted Franklin County with administering standard IPM school-based surveys, which are confidential and without identifying individual information, via use of passive caregiver consent to achieve higher school-based response rates for practical purposes. Students and parent(s)/guardian(s) were informed of the study and their rights to decline to participate at any time with no penalties. All aspects of data collection were reviewed and approved by the National Bioethics Committee of Iceland (protocol number: VSNb2017020009/04.01) and relevant governing bodies in Franklin County, KY.

Measures

Outcomes

Two variables were selected from the dataset to measure the intended purpose of the YES Card to increase participation in both supervised out-of-school activities and sports in Franklin County.

Participation in nonsport supervised recreational out-of-school activities (ORGREC). One question was used to assess participation in organized recreation: ‘how many times a week do you participate in any of the following out-of-school activities that are supervised by adults? Music, art, drama, or dance’. Responses ranged from 1 = ‘never or almost never’ to 9 = ‘7 times per week’ and were dichotomized to 0 = ‘once per week or less’ and 1 = ‘twice per week or more’ due to negative skew in the scale distribution.

Participation in supervised sports (SPORT). One question was used to assess participation in organized sports: ‘how often do you engage in sports (practice or competition) with a sports team/club?’ Responses ranged from 0 = ‘almost never’ to 7 = ‘almost every day’ and were dichotomized to 0 = ‘twice per week or less’ and 1 = ‘thrice per week or more’ due to negative skew in the scale distribution.

Control variables

Gender. One question was used to assess self-identified gender: ‘how would you describe your gender?’ Responses 1 = ‘boy’, 2 = ‘girl’, 3 = ‘others’ and 4 = ‘gender nonconforming’. Responses were collapsed to 1 = ‘boy’, 2 = ‘girl’ and 3 = ‘others’.

Family financial status. One question was used to assess family financial status: ‘how well off financially do you think your family is compared to other families?’ Responses ranged from 1 = ‘much better off’ to 7 = ‘much worse off’. Responses were reverse-coded then collapsed to 1 = ‘better off’, 2 = ‘no difference’ and 3 = ‘worse off’.

Race. One question was used to assess self-identified race: ‘how would you describe your race?’ Responses included 1 = ‘American Indian or Alaska Native’, 2 = ‘Asian’, 3 = ‘Black or African American’, 4 = ‘Native Hawaiian or Other Pacific Islander’, 5 = ‘White or Caucasian’, 6 = ‘More than one race’ and 7 = ‘others’. Because response rates were low for some of the self-identifying categories, responses were recoded to 1 = ‘White or Caucasian’, 2 = ‘Black or African American’ and 3 = ‘others’.

Statistical analyses and handling of missing data

Two models (M1, M2) equations were decided upon based on knowledge about the relatedness of variables within the IPM within and outside of the Icelandic context [9] resulting in the following model equations:

M1: $\text{ORGREC—YES Card} \times \text{time} + \text{YES Card} + \text{time} + \text{gender} + \text{race} + \text{family financial status}$

M2: $\text{SPORTS—YES Card} \times \text{time} + \text{YES Card} + \text{time} + \text{gender} + \text{race} + \text{family financial status}$.

These model equations served as a basis for determining the models of best fit. Missingness of the variables included in exploration analyses of these models ranged from 0 to 30%. Using the RStudio Multivariate Imputation by Chained Equation library [21], imputation of missing data was performed in two series using two different imputation methods. In the first series, both model datasets were imputed five times using predictive mean matching (PMM) on each variable with 100 iterations. In the second series, both datasets were again imputed five times with the same number of iterations using the polytomous regression method on all unordered categorical variables, ordinal logistic regression method on all ordered categorical variables and the PMM on all remaining variables. Subsequent logistic regressions were run on each imputed dataset and compared using the Akaike information criterion (AIC) and area under the curve across all models. AIC was given priority in model selection. This methodology was

repeated several times using various auxiliary variables from the original dataset. In the end, the first five datasets imputed using the PMM method without additional auxiliary variables provided the best fit. Coefficients from this dataset were pooled and then subsequently exponentiated to derive ORs and accompanying 95% CIs.

As an additional handling of missing data, both models were analyzed after a listwise deletion method was applied to the original dataset. All participants in the original dataset with more than 15% missing data across rows were deleted from the dataset, and missingness was reduced to 0–20%. Logistic regressions were again run on Models M1 and M2, and coefficients were exponentiated to derived odds ratios and 95% confidence intervals. A final comparison of models determined that analyses conducted on the listwise-deleted dataset were superior to both model analyses using the imputed datasets. As a final step, variance inflation factor was calculated using the RStudio CAR library [22] and ranged between 1.01 and 3.53 across all variables. Calculated odds ratios and accompanying confidence intervals varied only by a few percentage points between the imputed and listwise-deleted dataset analyses; as such, the results reported in this study are from analyses using the listwise-deleted dataset due to superior fit.

Results

Table II shows study sample characteristics stratified by intervention type (received YES Card, no intervention). In 2020, a lower proportion of students reported participation in organized out-of-school activities compared to 2021 (17.9% in 2020 and 32.5% in 2021) in the YES Card group. In the comparison group, 17.3% of children reported participation in supervised out-of-school activities in 2020 compared to 19.7% in 2021. Similarly, a lower proportion of students reported participation in organized sports in 2020 compared to 2021 (41.1% in 2020 and 57.0% in 2021) in the YES Card group. In the control group, 45.9% of students

Table II. Study sample characteristics

	YES Card+ (<i>N</i> = 246) (%)		YES Card- (<i>N</i> = 1596) (%)	
	2020 (<i>n</i> = 112)	2021 (<i>n</i> = 134)	2020 (<i>n</i> = 723)	2021 (<i>n</i> = 873)
Gender				
Male	40.2	44.8	47.85	50.17
Female	58.0	49.3	49.79	43.39
Others	1.00	5.90	2.36	6.43
Race				
White	74.11	70.89	68.38	59.79
Black	13.39	10.45	12.21	12.98
Others	12.50	18.66	19.42	27.23
Financial status				
Better	7.14	6.81	8.19	7.81
No difference	42.86	41.67	42.51	37.99
Worse	50.00	51.52	49.29	54.20
Factors				
Participation in supervised out-of-school activities (0 = once per week or less, 1 = twice per week or more)	17.9	32.5 (+81)	17.3	19.7 (+14)
Participation in organized sports (0 = less than thrice per week, 1 = thrice per week or more)	41.1	57.0 (+39)	45.9	43.5 (-5.2)

YES Card+ = received YES Card intervention (Second Street School), YES Card- = did not receive YES Card intervention (Bondurant Middle School, Elkhorn Middle School).

reported participation in organized sports in 2020 compared to 43.5% in 2021.

Table III shows results from the Model 1 and 2 regressions, controlling for gender, race, year and family financial status. In Model 1, a significant interaction effect indicates that the odds of participation in supervised out-of-school activities such as arts, music and dance were more than twice as high in 2021 when receiving the YES Card intervention [odds ratio, OR, 2.43 (95% confidence interval, 95%CI, 1.07–5.52)] compared to the group not receiving the YES Card. Girls and students who identified as neither girls nor boys were almost three times more likely to participate in nonsport out-of-school activities [girls: OR: 2.91 (95%CI: 2.24–3.78); others: OR: 2.80 (95%CI: 1.68–4.66)]. No significant differences were found across self-identified races. Finally, students who perceived their family financial status as being worse off than others were more likely to participate in arts, music and dance activities [OR: 1.50 (95%CI: 1.17–1.92)].

In Model 2, a significant interaction effect indicates that the odds of participation in organized sports were almost twice as high in the YES Card intervention group (OR: 1.91 [95%CI: 1.08–3.38]) compared to the group not receiving the YES Card. No gender differences were found. Students who self-identified as Black/African American were more likely to participate in organized sports [OR: 1.44 (95%CI: 1.09–1.89)], and students who perceived their financial status as worse off than others were more likely to participate in organized sports [OR: 1.60 (95%CI: 1.34–1.91)].

Discussion

One of the four core domains of the IPM concerns adolescent leisure time [6]. Building on findings from multiple studies from around the world, the model assumes that youth who participate regularly in organized recreational and/or extracurricular activities supervised by caring adults will benefit

Table III. Exponentiated logistic regression model results (with interaction effect) for participation in organized out-of-school activities and sports (controlling for gender, race and financial status)

	Organized out-of-school activities OR (95% CI)	Sports OR (95% CI)
Time	1.38 (1.08–1.76)	1.03 (0.87–1.24)
Received: YES Card	0.82 (0.41–1.76)	1.50 (0.99–2.26)
Gender: female	2.91 (2.24–3.78)	0.82 (0.69–0.97)
Gender: others	2.80 (1.68–4.66)	0.16 (0.08–0.31)
Race: Black	1.20 (0.82–1.77)	1.44 (1.09–1.89)
Race: others	1.17 (0.88–1.56)	0.98 (0.79–1.21)
Finance: worse	1.50 (1.17–1.92)	1.60 (1.34–1.90)
Finance: better off	0.93 (0.59–1.48)	0.73 (0.52–1.03)
Received: YES Card × time	2.43 (1.07–5.52)	1.91 (1.08–3.38)

Reference variables: received YES Card (reference: did not receive YES Card), gender: female, gender: others (reference: gender: male), race: Black, race: others (reference: race: White), finance: worse, finance: better off (reference: finance: no difference), received YES Card × time (reference: did not receive YES Card × time).

from such participation in terms of their mental health, increased prosocial attitudes and positive character building and decrease the odds of them engaging in early substance use behaviors and/or delinquency [7, 9, 14, 23–28]. Increasing participation in organized activities at the local community level for youth who typically lack such opportunities represents one of the key intervention mechanisms suggested by the IPM. A viable approach to increasing such participation for youth is via a locally tailored voucher system such as the Reykjavik City Leisure Card program that has been effective in Iceland [29]. The findings from this study suggest that targeting the IPM's leisure time assumptions outside of Iceland through a leisure time intervention voucher card is a feasible approach to increase participation in out-of-school activities and sports among middle-school-aged adolescents. In 2021, the odds of participating in supervised nonsport out-of-school activities were almost 2.5-fold higher in the intervention group (students who received the YES Card compared

to students sampled in 2020). Similarly, the odds for organized sports participation three times per week or more were almost twofold higher in students sampled in 2021 compared to those sampled in 2020.

Direct comparisons to studies of other voucher programs aimed at reducing the cost barrier to participation in organized activities are methodologically challenging due to differing outcomes of interest and varying degrees of exposures. However, like other studies, these findings also highlight that potential gender and socioeconomic differences may arise in the likelihood of participation across different types of leisure time activities that ought to be considered by communities that wish to increase participation in any form of organized activities. In both instances, for non-sport organized out-of-school activities, and for sports, the odds of participation were significantly greater among youth who perceived themselves on the lower end of the socioeconomic spectrum compared to the ones on the higher end of the socioeconomic spectrum. This finding is particularly noteworthy as socio-economic status is a well-established risk factor that limits opportunities to partake in organized recreational and extracurricular activities among youth [13, 25, 26] and for early onset of substance use [6, 7]. In addition, our findings highlight that outside of Iceland, focusing solely on sports to increase participation rates in organized leisure activities may mainly benefit boys, thereby potentially having little to no impact on participation among gender-diverse adolescents and girls. Communities outside of Iceland that wish to increase participation in organized recreation among youth, regardless of gender identity, may benefit from offering a wide range of vendors who include other supervised out-of-school activities and not merely sports-related opportunities.

In recent years, the issue of public health interventions needing to be culturally appropriate for local adoption and translation has been highlighted [30–32]. Presumably, transferring an intervention idea from Reykjavik Iceland to rural KY in the USA should be considered only after taking account of cultural appropriateness. At minimum,

this would include consideration of (i) absolute cost in the respective currency and variation in purchasing power, (ii) types of activities most likely to be attractive and attainable for the target population, (iii) mode of delivery for each activity, (iv) availability of vendors who may partake in the voucher program, (v) minimum quality standards and requirements of vendors, and (vi) simplicity versus complexity of partaking in the voucher program for both vendors and youth participants and their families. Those factors guided the selection of the intervention school for the YES Card. The voucher amount is sufficient to cover the cost of participation for most programs that last a minimum of 4 weeks. Matching the size of potential participant pool with the available grant-funded amount that could be used for the voucher intervention thus was a priority. Furthermore, the intervention school is geographically located where program vendors were available and accessible for most participants. The application for the YES Card voucher was made easily accessible via web portal specifically designed for this purpose in order to reduce administrative and/or organizational barriers for the utilization of the voucher.

This study has several limitations as well as some notable strengths. First, the analyses are limited to a single county in KY in the USA, so findings may not apply to other areas. Second, a limited number of vendors participated in the voucher intervention program, which may have impacted the number of participants in the program. Third, analyses are only conducted with 2 years of repeated cross-sectional data for children who attend three schools and thus may not apply to other school levels and/or age groups. Fourth, dance was included as an example of supervised out-of-school activity and not as a sport. It is possible that some respondents who engage in dance may have found this distinguishment confusing and responded to sport participation while engaging in dance. Fifth, students who received the YES Card were not identified as such in the survey. We therefore are unable to rule out other reasons for change in activity

participation. Finally, the analyses did not disentangle program participation odds by type of activity, which may be helpful in future assessments of the leisure time voucher program. Strengths of this study include a sample with a high response rate for all participating schools, a natural experimental design including a comparison group, which partially overcomes the limitation of no baseline in the intervention school, and assessment over time.

In conclusion, this study reveals that Franklin County in KY in the USA has successfully adapted the Reykjavik City Leisure time voucher program and that the proportion of students participating in organized recreational and extracurricular out-of-school activities among youth in the county increased significantly the following year. Findings show that over a 1-year period, the odds of participating in either organized nonsport activities or sports increased more than twofold by children attending the intervention school compared to those attending the two demographically similar comparison schools. These results suggest that the Reykjavik City Leisure voucher program can potentially be transferred to other settings via consideration of culturally appropriate adaptation practices.

Conflict of interest statement

C.E.C.M., I.E.T., J.S. and G.A.E. are employed by Planet Youth. A.L.K. consults for Planet Youth. A.B. is employed by the Franklin County Health Department, KY.

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