It's Complicated: A Peer Taught Cannabis Education Program

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Background

- Initiation of cannabis use often begins during the high school years.[1]

- High school students are at risk of experiencing various consequences from cannabis use.[2]

- School-based interventions and programming have the potential to reduce risky cannabis use.[3]

- Most of the existing programming did not reflect changes in the legal status of cannabis in many states across the U.S.[4,5]

Missouri Landscape

Medicinal

November 2018

via Constitutional Amendment

Adult use

November 2022

via Constitutional Amendment

Missouri Teens

- By the time Missouri teens reach 12th grade, 1 in 10 have used cannabis.[6]

- Lifetime and 30-day use rates for cannabis were higher in Missouri than nationally.

  - 10.8% of 9th through 12th graders used marijuana in the past 30 days

- 22.5% of 9th-12th graders state their peers would think they are "pretty cool" or "very cool" if they smoked marijuana

- From 2016 to 2018, there was a slight increase in the percentage of students who believed it was not risky to use marijuana. From 2018 to 2020, it increased again before stagnating in 2020 and 2022.

PreventEd works to reduce or prevent the harms of alcohol and other drug use through education, intervention and advocacy.
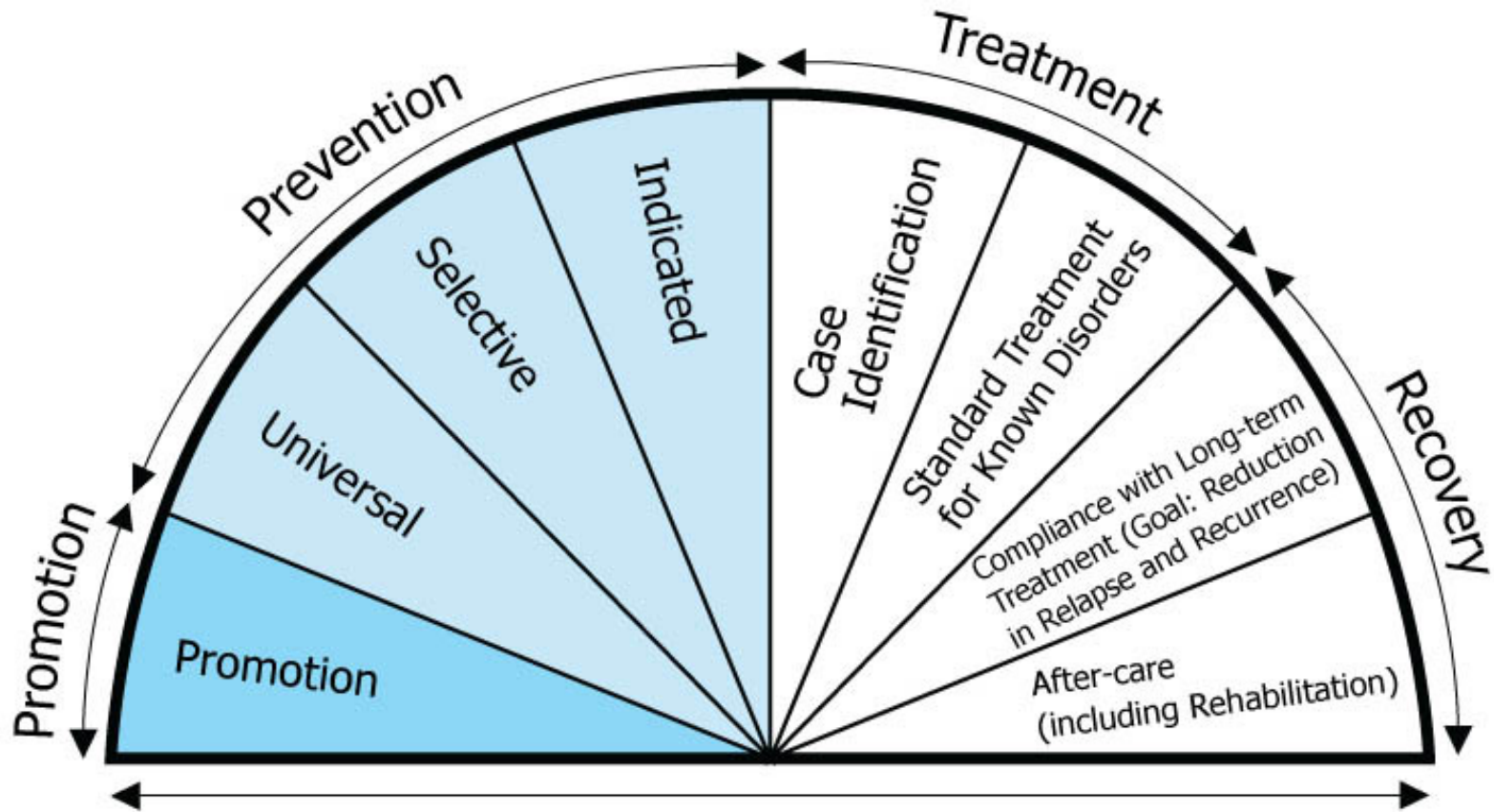
Risk Factors for SUD

- Parents misuse

- Victims of abuse

- Easy availability

- Poor self concept

- Difficulties coping with stress

- Academic failure

- Weak family relationships

- Early experimentation

- Behavior problems

- Trauma

WHO'S IN THE ROOM?

Continuum of care for substance use disorders

Origins of It's Complicated

In 2017, PreventEd (then NCADA-STL) received funding from the Missouri Health Foundation to develop, deliver, and evaluate a cannabis education curriculum in Missouri high schools.

Identified two schools to pilot the curriculum, and one (Hillsboro High School in rural Jefferson County) as the test site.

Curriculum Design

- Originally planned as 4 sessions → consolidated to 3 sessions to improve fit with the class schedule.

  - Lesson 1: The science of cannabis (THC vs. CBD; medicinal cannabis)
  - Lesson 2: Effects of cannabis on the teen brain and the reality behind industry marketing strategies
  - Lesson 3: Navigating risks / Expressing concern about friends

- Delivered by peer teachers (usually juniors and seniors) to younger students (usually freshmen and sophomores).

  - Support from PreventEd staff and the local school champion/sponsor

Evaluation Methods

- Cluster-randomized, delayed intervention randomized trial.

- At the beginning of each semester, health classes were randomized to receive *It's Complicated* either: **(a)** Early, or **(b)** Later in the semester.

- A series of surveys were conducted among all classes (three survey waves administered on the same schedule).

- Three semesters: Fall 2019, Spring 2020, Spring 2021.

- COVID disruption and adjustment.

Evaluation Methods (cont.)

- Because the school adopted the curriculum as part of the standard health class and student surveys were de-identified, the Western IRB determined the study to be exempt.

- Nevertheless, written consent was obtained from the students' parent/guardian, and assent from the student.

- Surveys were intentionally brief (one page front and back).
    - Confidentiality protections
    - Surveys were carefully proctored
    - $20 gift card

Evaluation Methods (cont.)

- **Advantages:**

  - All students would have access to the curriculum.

  - Avoids disruption of breaking up classrooms.

  - Greater acceptability to stakeholders.

- **Drawbacks:**

  - Required a very short follow-up period.

  - Measurement was limited to proximate effects and antecedents of behavior, but not cannabis use itself.

Sample Schedule

	Oct 1	…	Oct 15	Oct 16	Oct 17	…	Oct 28	Oct 29	Oct 30	Nov 1-7
All classes										
Intro; Consents distributed	▮									
Consents returned			▮							
Surveys (all classes)			wave 1				wave 2			wave 3
Classrooms (Periods)										
1							sess. 1	sess. 2	sess. 3	
2							sess. 1	sess. 2	sess. 3	
3			sess. 1	sess. 2	sess. 3					
4			sess. 1	sess. 2	sess. 3					
5							sess. 1	sess. 2	sess. 3	

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Outcome Measures

- **Knowledge and self-efficacy (7 domains)**
    - (1) how marijuana works in the brain and body;
    - (2) risks of using marijuana;
    - (3) medical uses of marijuana;
    - (4) effects of different chemicals like THC and CBD;
    - (5) differences between medical marijuana and prescription medications,
    - (6) the current status of marijuana laws in the US, and
    - (7) how to help a friend who may have a problem with marijuana.
- **Perceptions of risk and harm**
    - Questions from NSDUH

- **Behavioral intentions**
    - "How likely are you to use marijuana in the next year"?
    - "If a friend of yours had a problem with marijuana, how likely would you be to talk with them about it?"

Analysis

Generalized linear mixed models

- **Dependent variables:** Knowledge composite (mean of 7 knowledge items), individual knowledge items, risk perceptions, etc.

- **Explanatory variables:**

  - Wave (1 vs. 2 vs. 3)

  - Curriculum Timing (Early vs. Late)

  - Wave X Curriculum Timing interaction

- **Random intercepts:**

  - Students nested in classrooms

Accounts for both repeated measurement of the same student and the cluster-randomized design.

Analysis (cont.)

- Intention to treat (*N*= 195)

  - Analyze students in the groups to which they were assigned.

- Sequence per Protocol (*N*= 165)

  - Drop cases if there were problems with the sequence of the curriculum and surveys (e.g., reported receiving *It's Complicated* before they were supposed to).

- Sensitivity

  - Restricted sample with complete data for all three survey waves.

  - *N*= 150 (Intention to Treat)

  - *N*= 123 (Sequence per Protocol)

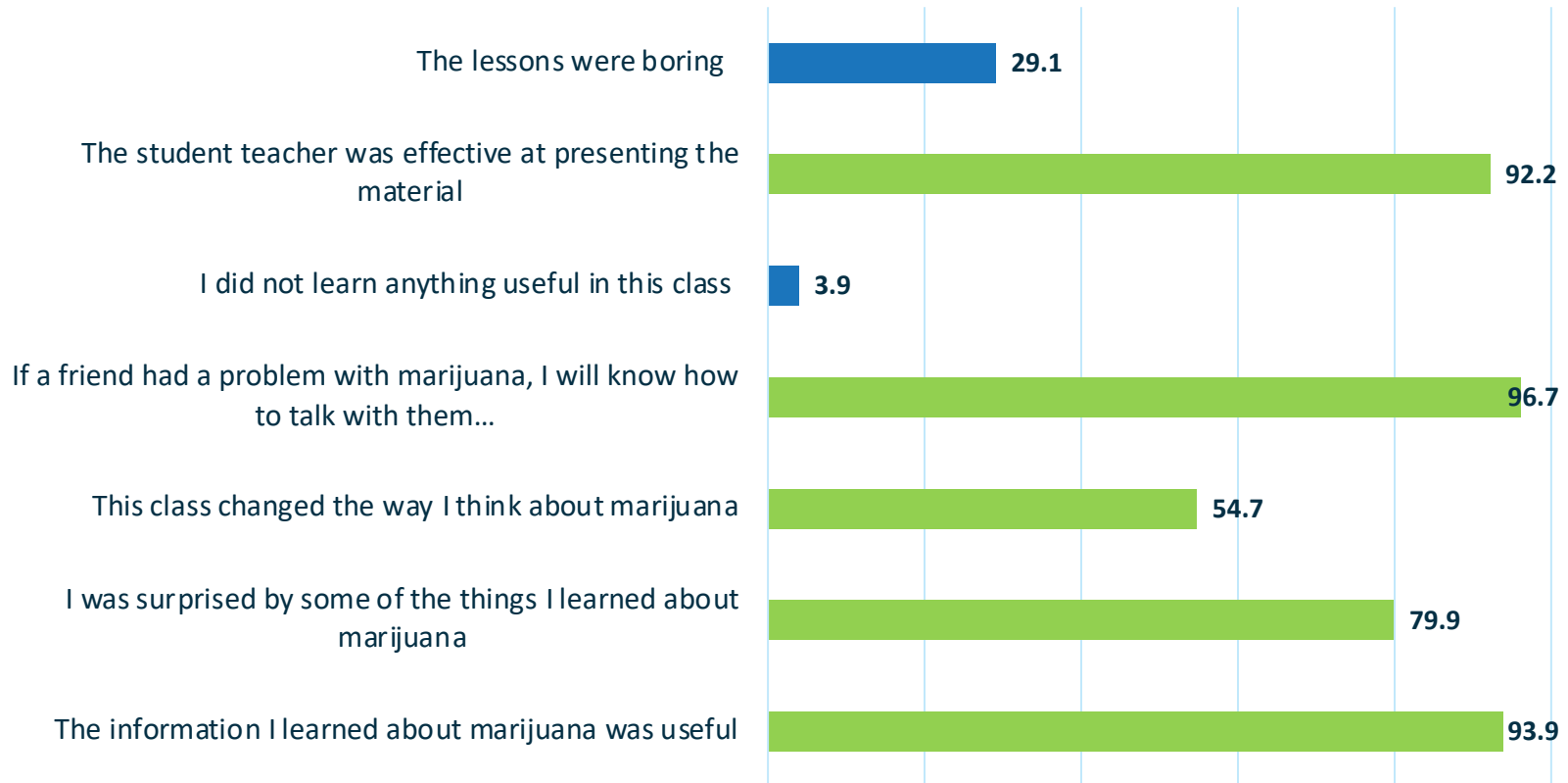 - Restricted sample to those who reported being 'very truthful'

Sample characteristics (*N*= 195 students)

- 52% female

- 82% first or second year in high school

- 30% reported cannabis use in the past year
  - Most of these youth (24% overall) met thresholds for needing intervention based on the CRAFFT screener.

- 57% thought "most" or "all" of their friends used cannabis

- 85% completed all three survey waves

- > 95% reported being 'very truthful' in their responses at each survey.

Post-Curriculum Survey Results

Percent Endorsing "Agree" or "Strongly Agree"

Question	Value
The lessons were boring	29.1
The student teacher was effective at presenting the material	92.2
I did not learn anything useful in this class	3.9
If a friend had a problem with marijuana, I will know how to talk with them…	96.7
This class changed the way I think about marijuana	54.7
I was surprised by some of the things I learned about marijuana	79.9
The information I learned about marijuana was useful	93.9

Summary of Outcomes

	P-value
Marijuana Knowledge	
Composite (mean of knowledge items)	**< 0.001**
Individual Knowledge Items	
How marijuana works in the brain and body	**< 0.001**
The risks of using marijuana	**< 0.05**
The medical uses of marijuana	0.12
The effects of different chemicals in marijuana (CBD, THC)	**0.002**
The differences between medical marijuana and Rx medications	**0.007**
The current status of marijuana laws in the US	0.059
How to help a friend who may have a problem with marijuana	**0.011**
Behavioral Intentions	
How likely do you think you are to use marijuana in the next year?	0.759
Likelihood of expressing concern	
If a friend of yours had a problem with marijuana, how likely would you be to talk with them about it?	0.717
Perceived health risks (general)	
I see any use of marijuana as a potential danger to a person's health.	0.254
Perceived risk of infrequent (monthly) use	
How much do people risk harming themselves physically or in other ways when they smoke marijuana once a month?	**0.027**
Perceived risk of more frequent (weekly) use	
How much do people risk harming themselves physically or in other ways when they smoke marijuana once or twice a week?	0.161

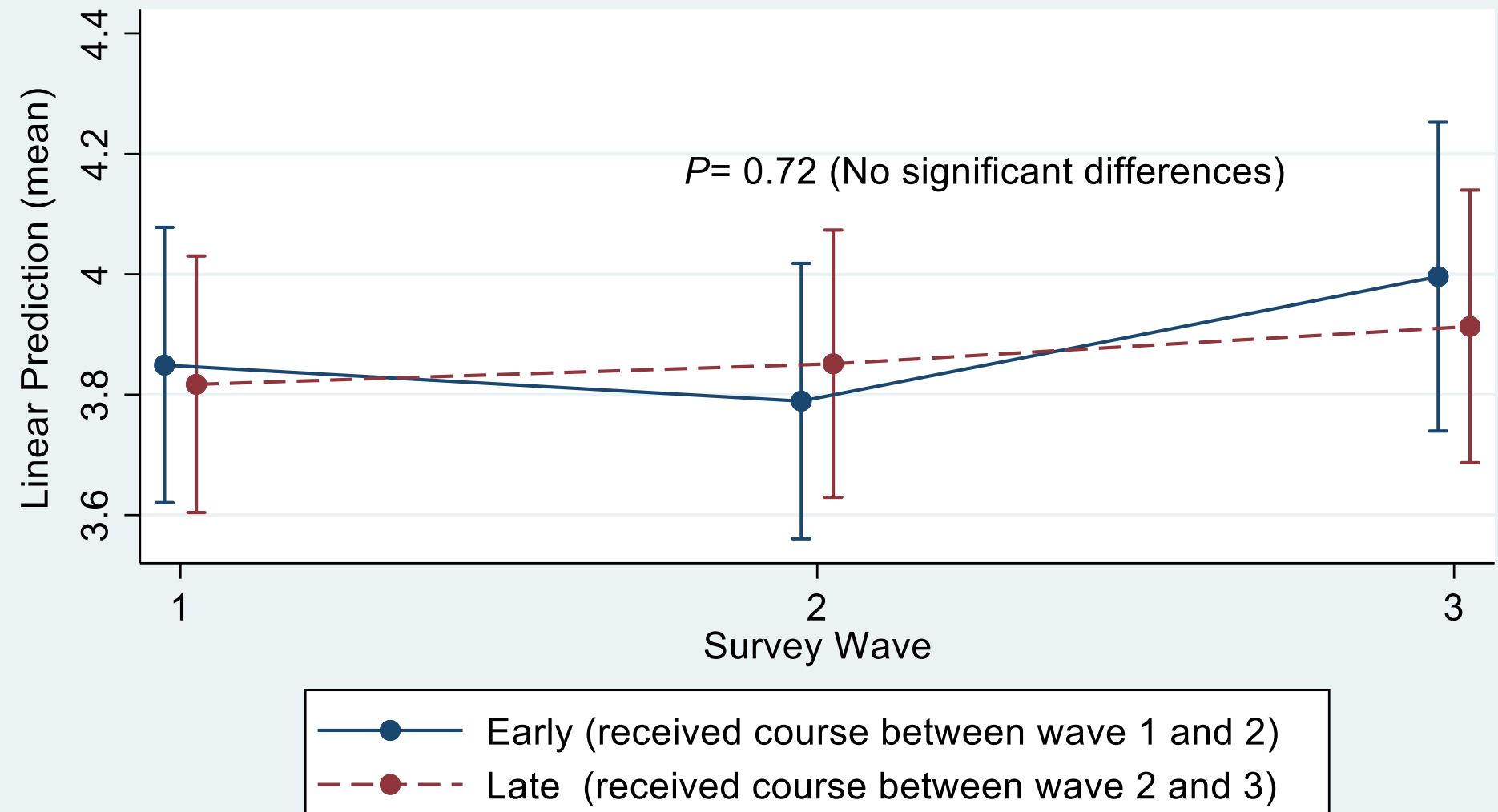Self-Reported Likelihood of Using Marijuana in the Next Year with 95% Confidence Intervals
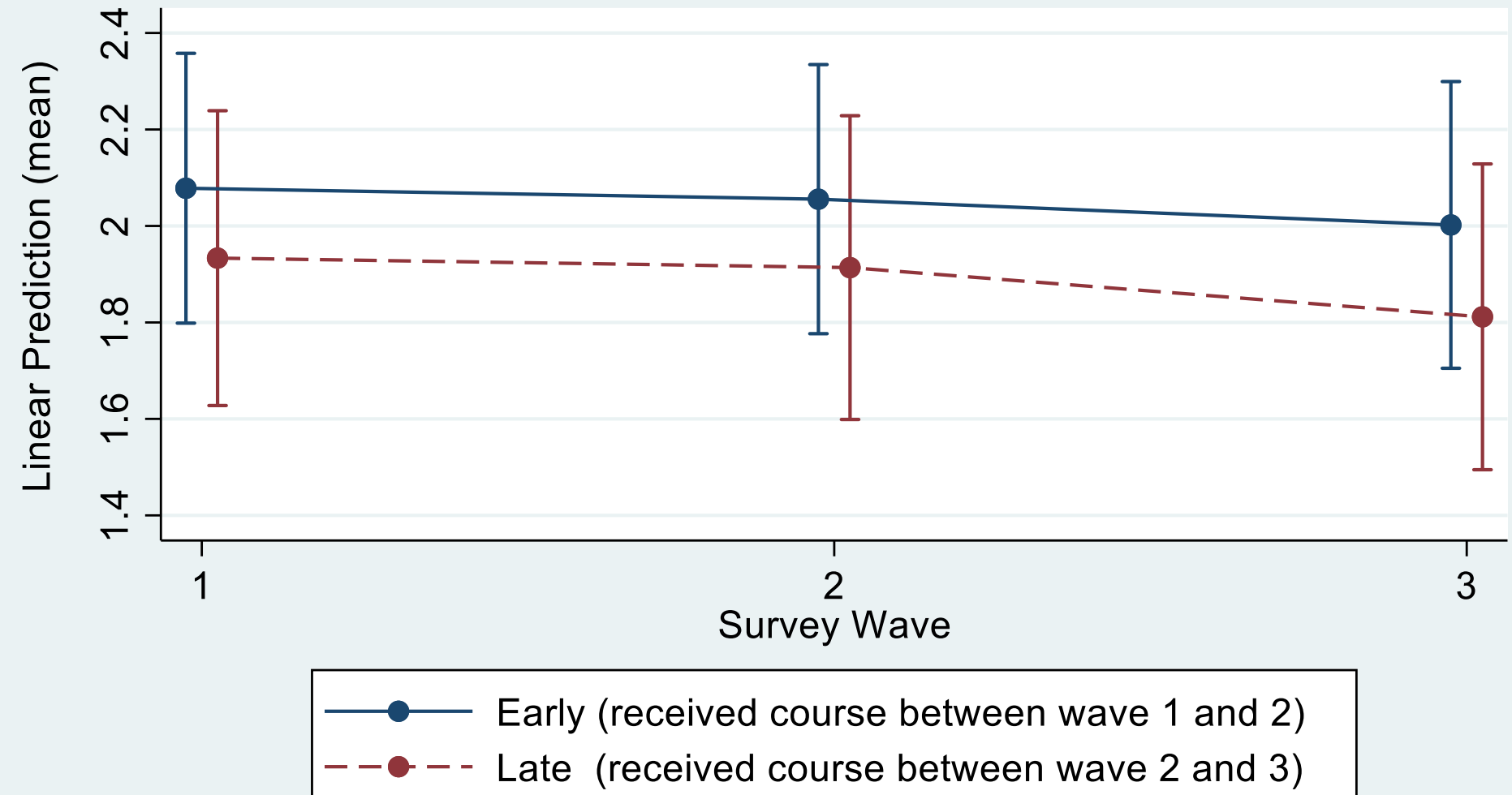
Note: How likely do you think you are to use marijuana in the next year?
1= Very unlikely, 2= Somewhat unlikely, 3= Not sure, 4= Somewhat likely, 5= Very likely.
Model predictions from mixed effects linear regression, with participants nested in classrooms.

Likelihood of expressing concern about a friend's marijuana use with 95% Confidence Intervals

P= 0.72 (No significant differences)

Survey Wave

Linear Prediction (mean)

— ● — Early (received course between wave 1 and 2)
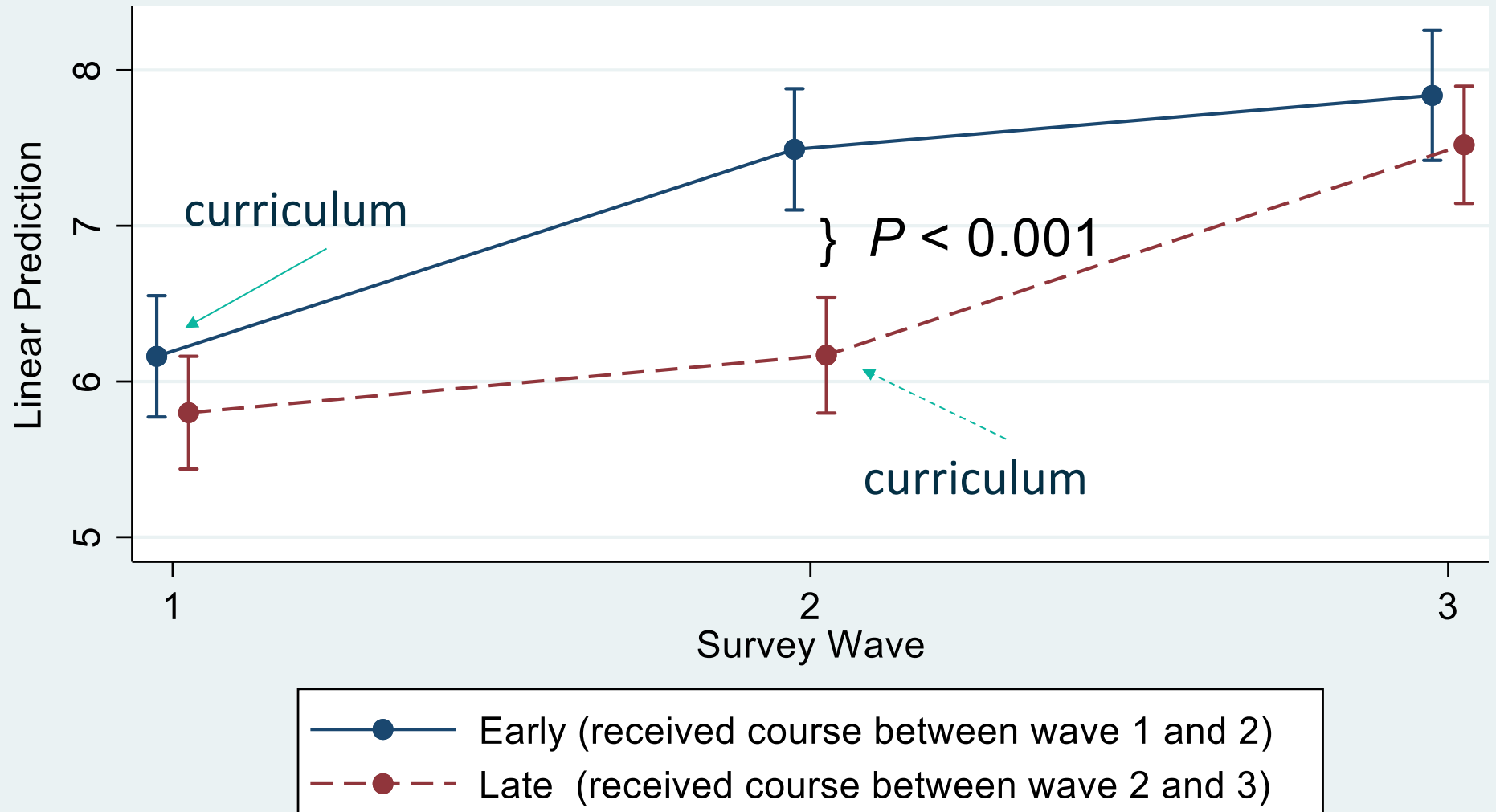- - ● - - Late (received course between wave 2 and 3)

Note: If a friend of yours had a problem with marijuana, how likely would you be to talk with them about it?
1= Very unlikely, 2= Somewhat unlikely, 3= Not sure, 4= Somewhat likely, 5= Very likely.
Model predictions from mixed effects linear regression, with participants nested in classrooms.

Perceived Risk of Monthly Marijuana Use with 95% Confidence Intervals
(n=165 who received course and surveys in the intended sequence)
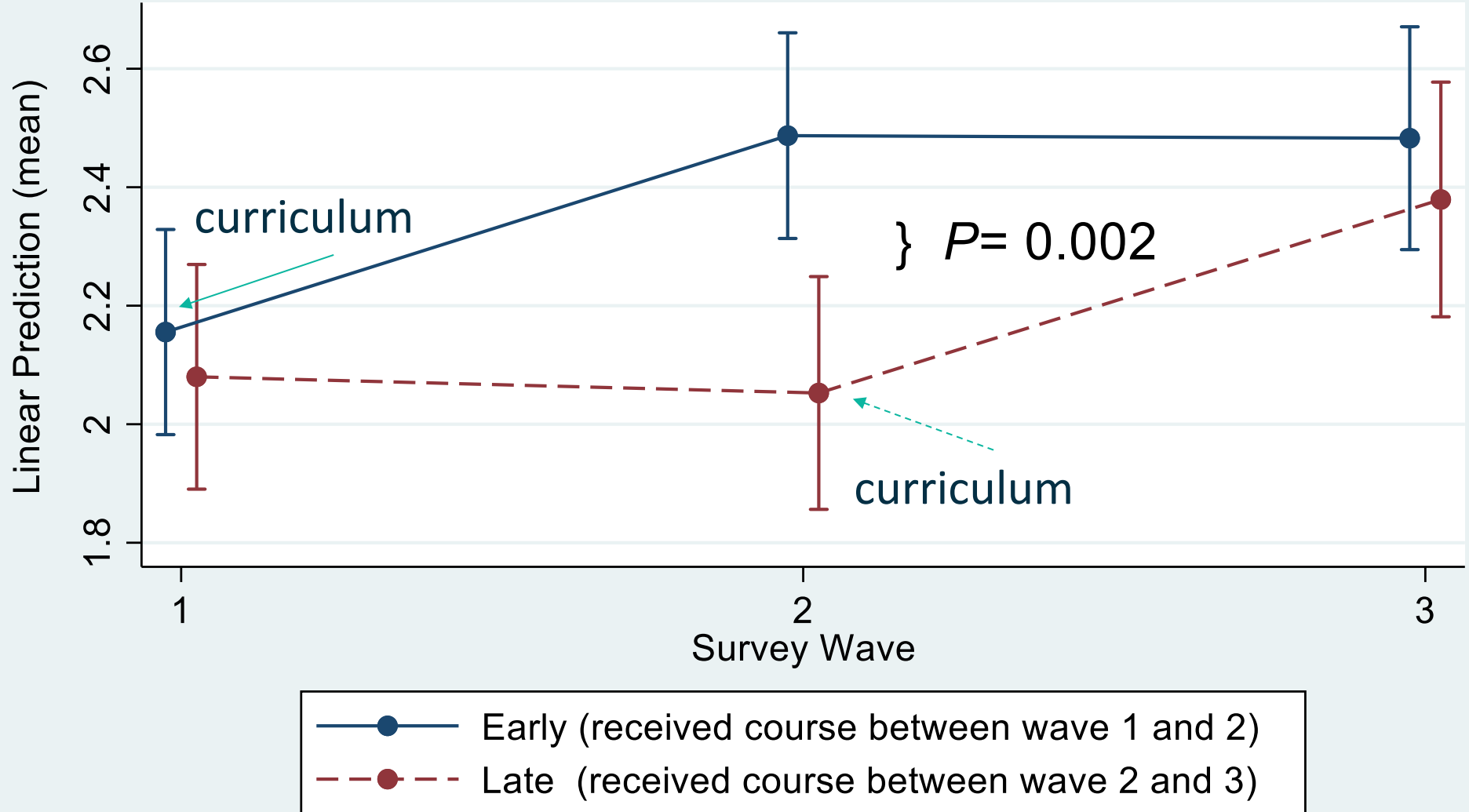
Note: How much do people risk harming themselves... when they smoke marijuana once a month?
[Question from NSDUH]; 1= No risk, 2= Slight risk, 3= Moderate risk, 4= Great risk.
Model predictions from mixed effects linear regression, with participants nested in classrooms.

Mean Marijuana Knowledge Ratings
with 95% Confidence Intervals

} *P* < 0.001

curriculum

curriculum

Early (received course between wave 1 and 2)
Late (received course between wave 2 and 3)

Note: Mean ratings for 7 cannabis knowledge items (How would you rate your level of knowledge about...);
      Self-rated knowledge on each item ranged from 1 (low) to 10 (high);
      Model predictions from mixed effects linear regression, with participants nested in classrooms.

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Discussion

- The evaluation of *It's Complicated* found significant curriculum effects using a methodologically strong random assignment design.

- Significant curriculum effects for self-rated cannabis knowledge (overall and across multiple knowledge items) and perceived risks of infrequent cannabis use.

- No effects on behavioral intentions regarding cannabis use or expressing concern to a friend, perceived risk of frequent cannabis use, or perceived health risks.

- Findings were generally robust across different approaches to analysis (intention to treat, sequence per protocol) and sensitivity analyses.

Limitations

- Compromises to design in order to ensure feasibility.

- Relatively small sample, possibly underpowered to detect differences.

- Limited to self-report on proximal outcomes.

- Some protocol deviations regarding sequence.

  - A small number of students were exposed to the course content before intended.

- The COVID-19 pandemic and related closures were a significant disruption to delivering the curriculum and conducting the study.

What's Next?

❖ Presentation of the findings at scientific and practitioner meetings
❖ Publication of the findings in the peer-reviewed literature
❖ Further refinement and expansion of *It's Complicated* to other schools
❖ Larger trial of *It's Complicated* to support statewide or national dissemination

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- The Hillsboro High School students who participated in the evaluation

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6. 2022 Monitoring the Future

Questions?

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