JÚLIA DELL SOL PASSOS GUSMÕES

AVALIAÇÃO DO EFEITO DA FIDELIDADE DE IMPLEMENTAÇÃO NOS RESULTADOS DO PROGRAMA EDUCACIONAL DE RESISTÊNCIA ÀS DROGAS E À VIOLÊNCIA (PROERD)

Tese apresentada à Universidade Federal de São Paulo para obtenção do Título de Doutor em Ciências.

São Paulo
2023

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UNIVERSIDADE FEDERAL DE SÃO PAULO DEPARTAMENTO DE MEDICINA PREVENTIVA PROGRAMA DE PÓS-GRADUAÇÃO EM SAÚDE COLETIVA

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Dedicatória

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“Dizem que antes do rio entrar no mar, ele treme de medo. Olha para trás, para toda a jornada que percorreu, para os cumes, as montanhas, para o longo caminho sinuoso através de florestas e povoados, e vê à sua frente um oceano tão vasto, que entrar nele nada mais é que desaparecer para sempre. Mas não há outra maneira. O rio não pode voltar. Ninguém pode voltar. Voltar é impossível na existência. O rio precisa se arriscar e entrar no oceano. Somente quando entra é que o medo desaparece, porque apenas então o rio saberá que não se trata de desaparecer no oceano, mas sim tornar-se oceano.”

(Osho)

Resumo

Objetivo: Avaliar a fidelidade de implementação do PROERD e seu efeito no uso de drogas entre adolescentes. **Métodos:** Esse é um estudo de métodos mistos, onde foram realizadas observações da formação dos policiais instrutores e da aplicação de 30 aulas do programa em sala de aula. Ainda, os 19 policiais instrutores preencheram um formulário de fidelidade ao final de todas as lições ministradas e participaram de uma entrevista semiestruturada sobre a rotina de aplicação do PROERD. O ensaio controlado randomizado (ECR) para a avaliação da efetividade dos dois currículos do PROERD (5º e 7º anos) e as questões fechadas dos formulários de fidelidade formaram o eixo quantitativo e observações, entrevistas e questões abertas dos formulários de fidelidade formaram o eixo qualitativo. Os dados qualitativos foram submetidos a análise temática com suporte do software ATLAS.ti © versão 7.5.4. Os dados quantitativos dos formulários de fidelidade foram divididos em baixa e alta fidelidade e incorporados ao banco de dados da ECR para que análise de modelo linear de efeitos mistos fosse realizada através de STATA 17.0. **Resultados:** Apesar de não apresentarem efeito na efetividade do programa, alterações são realizadas pelos instrutores a fim de viabilizar o programa na realidade das escolas públicas de São Paulo. Além disso, também foi possível identificar que a formação de 40 horas que os policiais fazem para se tornarem instrutores pode não ser suficiente para abarcar questões de didática em sala de aula e, também, informações sobre drogas. **Conclusão:** Para que o PROERD seja viável em escolas públicas brasileiras, é necessário que haja a adaptação cultural do programa de acordo com a realidade do país e, ainda, que a formação de instrutores seja revisada com o auxílio dos desenvolvedores do D.A.R.E. kiR.

Palavras-chave: fidelidade de implementação; prevenção; métodos-mistos; adolescentes; escola; drogas.

Abstract

Objective: To evaluate PROERD's implementation fidelity and its effect on drug use among adolescents. **Methods:** This is a mixed methods study, in which observations were made of the training of police instructors and of the program application in 30 classrooms. Furthermore, the 19 police instructors completed a fidelity form at the end of all the lessons given and participated in a semi-structured interview about PROERD's application routine. The randomized controlled trial (RCT) to evaluate the effectiveness of the two PROERD curricula (5th and 7th grades) and the closed questions from the fidelity forms formed the quantitative axis and observations, interviews and open questions from the fidelity forms formed the qualitative axis. Qualitative data underwent thematic analysis using ATLAS.ti © version 7.5.4 software. Quantitative data from the fidelity forms were divided into low and high fidelity and incorporated into the ECR database so that a mixed-effects linear model analysis could be performed using STATA 17.0. **Results:** Despite having no effect on the program effectiveness, changes were made by instructors in order to make the program feasible for the reality of public schools in São Paulo. In addition, it was also possible to identify that the 40-hour training that police officers undergo to become instructors may not be enough to cover teaching skills issues and also information about drugs. **Conclusion:** In order to PROERD to be feasible in Brazilian public schools, it is necessary that the program undergo a cultural adaptation to the country's reality and, also, it is important that the instructors' training be revised with the help of D.A.R.E. kiR developers.

Keywords: implementation fidelity; prevention; mixed-methods; adolescent; school; drugs.

Lista de abreviaturas e siglas

ABEP - Associação Brasileira de Empresas de Pesquisa

CEBRID – Centro Brasileiro de Informações sobre Drogas

CEP - Comitê de Ética em Pesquisa

D.A.R.E. - Drug Abuse Resistance Education

ECR - Ensaio Controlado Randomizado

EU-DAP - European Drug Addiction Prevention

IBGE – Instituto Brasileiro de Geografia e Estatística

INEP – Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira

kiR – Keepin' it REAL

MTDP - Modelo de Tomada de Decisão Proerd

NIDA – National Institute on Drug Abuse

OECD - Organization for Economic Cooperation and Development

PeNSE - Pesquisa Nacional de Saúde do Escolar

PM – Polícia Militar

PROERD - Programa Educacional de Resistência às Drogas e à Violência.

REBEC - Registro de Ensaios Clínicos do Ministério da Saúde

SES - Status Socioeconômico

UNODC – United Nations on Office Drugs and Crime

WHO - World Health Organization

Sumário

1. Apresentação

Esta tese faz parte de um estudo mais amplo intitulado “Avaliação da Efetividade do Programa Educacional de Resistência às Drogas e à Violência (PROERD) da Polícia Militar do Estado de São Paulo”, um ensaio controlado randomizado (ECR), financiado pela Fapesp (processo número 2017/22300-7). O projeto foi coordenado pela Profª Drª Zila van der Meer Sanchez Dutenhefner e terminou em 2022.

A presente tese se propõe a utilizar os dados do ECR juntamente com os dados coletados sobre fidelidade de implementação para investigar a influência desta no efeito do PROERD para uso de drogas entre adolescentes. Também, a partir dos dados qualitativos, visou-se investigar como o programa é aplicado, seus maiores desafios e potencialidades através da ótica do instrutor.

Esta tese foi estruturada no modelo alternativo a partir de dois artigos, um publicado e um submetido, escritos durante o desenvolvimento do projeto de doutorado. Desta forma, a seção de resultados passa a ser a apresentação deles, que são:

- Implementation fidelity of a Brazilian drug use prevention program and its effect among adolescents: a mixed-methods study. Substance Abuse Treatment Prevention and Policy
- Why and how Brazilian DARE-kiR instructors adapt the program during delivery: a qualitative implementation research approach.

2. Introdução

2.1 Uso de drogas e violência na adolescência

O abuso de álcool e outras drogas é uma das grandes questões da saúde pública na atualidade, sendo o álcool e o tabaco as drogas que mais contribuem para a morbimortalidade da população e para os anos de vida perdidos por incapacidade (1). O primeiro consumo destas substâncias costuma ocorrer na adolescência, em torno dos 13 anos de idade (2) e está associado com o desenvolvimento de problemas futuros, tais como dependência (3–5), ideação suicida (6), comportamento sexual de risco (7,8) e acidentes de trânsito (9).

A última Pesquisa Nacional de Saúde do Escolar - PeNSE - realizada em 2019 com estudantes de 9º ano, mostrou que houve aumento da experimentação de álcool em relação a 2015, sendo esse aumento maior entre as meninas (54,5% em 2015 e 67,4% em 2019) em comparação com os meninos (50,8% em 2015 e 58,8% em 2019). Em relação a outras drogas, 21% consumiu tabaco e 12%, drogas ilícitas (10). A baixa idade de início do consumo de drogas associada à importante prevalência deste comportamento entre os adolescentes traz evidências sobre a necessidade de investimentos em programas de prevenção efetivos para estes grupos etários (11,12).

Destaca-se ainda que, entre os adolescentes brasileiros, o padrão de consumo de álcool conhecido internacionalmente como binge drinking (caracterizado pelo consumo de 5 doses de álcool para meninos ou 4 doses para meninas em uma única ocasião) é relatado anualmente por 30% dos estudantes do ensino médio das capitais brasileiras, comfaixa etária de 15 a 18 anos (13). Estes episódios de uso abusivo e agudo de álcool são responsáveis por consequências tanto a curto como a longo prazo (ex: ferimentos e dependência de álcool (14), respectivamente) (15), sendo que o comportamento deperpetração de violência escolar, a ausência do pai e idades maiores são preditores

desse comportamento (16). Durante a adolescência, o indivíduo está em maior risco de danos agudos relacionados ao álcool, como intoxicação alcoólica, pela inexperiência em relação aos efeitos dessa substância (17), e também, o jovem está sujeito à piora no funcionamento cognitivo (18), aumento da impulsividade (18,19) e de outros comportamentos de risco (19). Estes dados corroboram a necessidade de uma intervenção que atue também na redução ou extinção da prática de consumo abusivo de álcool e, consequentemente, dos efeitos danosos por ela trazidos.

É sabido que o uso de álcool e outras drogas está associado com a vitimização entre os adolescentes (20). Aqueles que relatam terem sofrido bullying ou outros tipos de violência na escola são os que mais reportam o uso de tabaco, álcool e drogas ilícitas, sugerindo, possivelmente, uma forma de automedicação para os transtornos decorrentes dos possíveis traumas vividos (21,22). Recentemente, a relação temporal da associação entre o uso de álcool e outras drogas e os comportamentos violentos entre adolescentes foi definida. Cogo-Moreira e colegas (23) encontraram que a perpetração da violência ocorre antes do uso de drogas, indicando o consumo destas substâncias ocorre em decorrência de um padrão de comportamento de risco do adolescente (24) e de seus pares (25).

Depois da violência doméstica, a violência escolar é a mais comum entre crianças e adolescentes (26), ameaçando a integridade dos mesmos e comprometendo a qualidade da educação oferecida (27). Em relação ao bullying, sabe-se que este afeta o desenvolvimento emocional e o bem-estar do adolescente (28) e pode estar associado à suicídio (29) e a comportamentos delinquentes futuros (30). Novamente, segundo a última PeNSE, dentre alunos do 9º ano no Brasil, 23% relataram sofrer bullying pelo menos duas vezes no mês anterior à pesquisa, não havendo diferença entre estudantes de escolas públicas e privadas (31).

Recentemente, Mulla e colegas (32) encontraram que alunos que sofrem violência em ambiente escolar apresentam uma sensação de falta de conexão com a escola e que a falta de conexão, por sua vez, está associada ao aumento de binge drinking e uso de maconha. Assim, além de violência e uso de drogas serem comportamentos de risco interligados (33), o ambiente escolar se mostra como moderador desta associação (34), pois a escola influencia estes fatores de acordo com as políticas que adota para lidar com estes episódios ou, inclusive, para preveni-los (35) , como o reforço de regras escolares bem definidas, o oferecimento de atividades extracurriculares (34) e a adoção de programas de prevenção baseados em evidência científica (36).

2.2 Programas de prevenção ao uso de drogas e violência em escolas

Programas escolares de prevenção têm sido implementados mundialmente com a intenção de reduzir ou retardar o início do consumo de álcool e outras drogas entre adolescentes (37), sendo uma das mais eficazes ferramentas de prevenção (38), visto que é neste local que as crianças passam a maior parte de seus dias, expostas a uma ampla rede de socialização e às influências destas instituições no oferecimento de normas e valores (39). Hoje, existem dezenas de programas escolares de prevenção ao uso de drogas que evidenciaram reduções significativas no uso, além da diminuição da intenção do consumo e melhora nas habilidades de resistência ao início desse uso por estudantes (40,41).

Estratégias preventivas reconhecidas como eficazes focam-se em reduzir fatores de risco e fortalecer fatores de proteção, informando os adolescentes sobre diversas drogas, trabalhando crenças normativas e habilidades de vida (36,42). No entanto, é comum que programas de prevenção não apresentem avaliação de sua efetividade (43), ou, ainda pior, quando avaliados, não demonstram efetividade na redução ou retardo do uso de substâncias (41). Desta forma, podemos estar expondo os adolescentes a um

potencial efeito iatrogênico de uma intervenção, ou seja, aumentando a probabilidade de consumo de álcool e outras drogas, quando na realidade o objetivo era o inverso. Isto foi evidenciado em duas revisões sistemáticas, sendo que os principais desfechos negativos foram encontrados em relação ao aumento do consumo de álcool (44,45). Os estudos que demonstraram desfechos positivos em relação à prevenção do consumo de drogas, evidenciaram fraqueza metodológica, como por exemplo, falta de grupo controle, falta de randomização ou análises que não consideravam a estrutura hierárquica dos dados de acordo com o sorteio amostral (45).

Neste mesmo sentido, um estudo brasileiro avaliou pela primeira vez os resultados de um programa de prevenção escolar através de um ensaio controlado randomizado multicêntrico em 6 cidades (46). Neste estudo, foi avaliado um programa que foi disseminado pelo Ministério da Saúde, denominado #Tamojunto. O programa se propõe a reduzir o consumo de drogas e a violência nas escolas públicas e é uma adaptação cultural do programa europeu *Unplugged*. Apesar de amplas evidências de sucesso na Europa, com redução no número de episódios de intoxicação alcoólica e uso de maconha recente entre estudantes (47), no Brasil este programa, quando aplicado a alunos de 7º e 8º anos, aumentou em 30% o risco de adolescentes do grupo que recebeu a intervenção iniciar o consumo de álcool quando comparados aos do grupo controle, que não haviam recebido a intervenção (46). Os resultados indicaram o primeiro sinal de alerta sobre o que tem sido ofertado para crianças e adolescentes em escolas no Brasil. As hipóteses levantadas para discutir este aumento envolvem: 1) as diferenças culturais e escolares existentes entre os países europeus e o Brasil; 2) a qualidade da adaptação cultural do programa e 3) a fidelidade da implementação. Depois de passar por um extenso processo de reformulação partindo dessas hipóteses, o programa, que passou a ser chamado

#Tamojunto 2.0, se mostrou eficaz na redução da iniciação de consumo de bebidas alcoólicas (48).

Para evitar gastos públicos desnecessários e tempo de aula investido em programas que não oferecem resultados adequados, acontece, desde a década passada, um movimento em prol do desenvolvimento e implementação de programas de prevenção baseados em evidências científicas, que tenham demonstrado reduzir ou retardar o consumo de drogas através de ensaios controlados randomizados (49). Segundo as diretrizes internacionais para a prevenção (50), os programas de prevenção devem apresentar as seguintes características, que são associadas a resultados positivos: métodos interativos, sessões semanais estruturadas, intervenções de reforço ao longo do tempo, implementadores bem treinados, abordar habilidades pessoais e sociais, tratar sobre conhecimento de riscos e crenças normativas.

No campo da prevenção da violência, apesar de menos estudados e implementados (51), alguns programas têm demostrado efeito na redução dos níveis de agressão verbal (52), física (53,54), sexual (55) e bullying (56) nas escolas, se mostrando também efetivos na melhora acadêmica do aluno e na resolução de problemas/conflitos (52). Por outro lado, Cox e colaboradores (2016) mostram em uma revisão sistemática que esses programas não parecem ser efetivos na diminuição da agressividade de adolescentes em situação de risco, porém, há efeito em crianças mais novas na mesma situação (58). Sendo assim, é mais indicado que programas de prevenção de violência para população de alto risco sejam realizados antes da adolescência (51). Além disso, existe uma grande necessidade de mais trabalhos na área da prevenção da violência que consigam traduzir as evidências científicas para a prática escolar e, assim, aumentar a aceitabilidade, fidelidade e sustentabilidade dos programas existentes (56).

Corroborando com a orientação internacional de que programas escolares de prevenção abranjam mais de um comportamento de risco (59), existem estudos que demonstraram que programas escolares que previnem o uso de tabaco, álcool e drogas ilícitas também podem ser eficazes na prevenção da violência escolar (60), assim como programas de prevenção à violência também se mostram simultaneamente efetivos na prevenção ao uso de álcool e outras drogas (57,61). Esse efeito bidirecional se deve ao fato do uso de drogas e da violência compartilharem de fatores similares de proteção (vínculo escolar, monitoramento parental, vínculos sociais e com a escola, entre outros) e de risco (raiva, depressão, e pares que são agressivos) (62). Tendo em vista que os dois comportamentos aqui tratados possuem forte associação e podem atuar como fator de risco um para o outro, é necessário que também haja uma abordagem sobre uso de drogas em programas de prevenção de violência e vice-versa.

2.3 Efeito da fidelidade nos programas de prevenção

As intervenções em saúde pública bem-sucedidas dependem cada vez mais da capacidade de identificar os componentes-chave da intervenção eficaz, para quem a intervenção é eficaz e em quais condições (63). Sabe-se que para aumentar a probabilidade de eficácia na disseminação do programa de prevenção, é necessário que haja compreensão de elementos do sistema que podem fomentar a adoção e entrega de programas sustentáveis (64). Porém, são poucos os estudos que separam os fatores que asseguram resultados bem-sucedidos, caracterizam a falha em alcançar o sucesso ou tentam documentar as etapas envolvidas na implementação bem-sucedida de uma intervenção e as avaliações de processos podem ajudar nessas descobertas (63).

Neste sentido, elas respondem a questões sobre como o programa foi implementado e como os resultados do programa foram atingidos (65). Tal avaliação se concentra em perguntas, como: o programa está sendo implementado como planejado? Como o

programa está atingindo seus objetivos? Quais atividades foram conduzidas? Quais materiais ou serviços os participantes receberam? Qual foi a experiência das pessoas? Além disso, a avaliação de processos possibilita identificar os pontos fortes e fracos do programa, quais partes do programa estão funcionando e quais não estão (66). Os componentes da avaliação de processo utilizados podem se resumir a fidelidade, viabilidade e aceitabilidade (67).

Para o presente estudo, optou-se pela pesquisa avaliativa de fidelidade de implementação. Esta consiste em acompanhar e avaliar a execução dos procedimentos de implementação dos programas, identificar barreiras e obstáculos à sua implementação, e gerar dados para sua reprogramação, por meio do registro de intercorrências e de atividades (66).

A fidelidade entende se o que foi planejado para ser ofertado efetivamente ocorreu e o nível de completude desta oferta (68), ou seja, ela responde a questões como: a intervenção foi aplicada da forma como ela foi desenhada (69,70)? Os componentes prescritos na intervenção foram implementados de acordo com o protocolo (63)? Logo, há uma tentativa de sanar dúvidas em relação à implementação dos programas e de responder se o motivo para o resultado negativo encontrado é o modelo do programa ou se é a implementação diferente da prevista (71–73). Assim, a fidelidade é entendida, por si só, como um fator determinante para obter bons resultados, sendo que quanto maior a fidelidade de implementação do programa, melhores os resultados para os desfechos estudados (64,74).

Porém, existem limitações as quais os implementadores de intervenções enfrentam e que dificultam a aplicação dos programas exatamente como consta o manual, principalmente com currículos muito rígidos, podendo gerar incômodos na aplicação (75). Assim, vem sendo discutido na literatura o conceito de flexibilidade dentro da

fidelidade de implementação (75–77), para viabilizar a implementação de uma forma embasada cientificamente, em que são mantidos os elementos-chave (75). É importante ressaltar que a literatura existente afirma que as intervenções requerem adaptação principalmente quando há incompatibilidades entre contextos (76,78), como é o caso do DARE-Kir e do PROERD, sendo extremamente necessária a adaptação cultural de currículos (48,79).

Tendo em vista o panorama brasileiro, Melo e colegas (80) realizaram a avaliação do processo de implementação do programa #Tamojunto2.0, analisando o treinamento dos professores, a fidelidade de implementação e a viabilidade do programa em escolas públicas brasileiras. Este estudo de métodos mistos contou com 5.371 alunos de oitavo ano em seu braço quantitativo e 13 professores e 8 profissionais da gestão escolar para seu braço quantitativo. Os resultados encontrados reforçaram a importância da qualidade do treinamento e de um acompanhamento técnico para a melhor aplicação dos programas pelos professores e mostrou uma baixa fidelidade de implementação do programa tanto em relação à completude das aulas, quanto em relação às mudanças realizadas. Mesmo este sendo um programa que possui sua efetividade comprovada (48), a pesquisa de processo de implementação encontrou desafios para sua implementação em larga escala no país. Foram apontados 3 pontos principais para que o programa tenha um melhor potencial de implementação: políticas públicas que apoiem programas voltados para habilidades de vida em escolas, capacitação técnica local para treinamento e acompanhamento de professores, sistema de avaliação continuada que acompanhe se e como o programa está sendo implementado, possibilitando a tomada de decisões a partir dos dados coletados regionalmente.

Comumente as medidas de avaliação da fidelidade de implementação são criadas de acordo com o contexto específico de determinado estudo e programas de interesses,

dificultando a comparação dos achados entre os estudos (81,82). Para o presente estudo, por ser uma ferramenta amplamente utilizada (74), a fidelidade foi acessada por meio de um formulário de acompanhamento aula a aula, preenchido pelos instrutores do Proerd (83), o qual acessou o conteúdo e a dose do programa ofertados a cada semana.

2.4 O PROERD

Desde 1992, a Polícia Militar de diferentes estados tem implementado gratuitamente em escolas públicas e privadas, o PROERD, Programa Educacional de Resistência às Drogas e à Violência, sendo hoje este programa o de maior prevalência nas escolas brasileiras (84). Historicamente, o PROERD tinha por base o Programa Drug Abuse Resistance Education (DARE) desenvolvido pela polícia de Los Angeles, Estados Unidos da América (EUA), cujo objetivo é reduzir a violência e o consumo de drogas entre estudantes do ensino fundamental, transmitindo informações sobre drogas que os auxiliassem nas tomadas de decisões saudáveis. Este currículo do DARE, que conta com 17 aulas, não evidenciou eficácia na redução do consumo de drogas nem a curto nem a longo prazo nos EUA (85,86). Em São Paulo, o currículo PROERD/DARE de 17 aulas foi avaliado no ano de 2007 e evidenciou ser neutro, ou seja, não houve diferenças estatísticas entre os grupos controle e intervenção (84). No entanto, é preciso destacar que este único estudo de avaliação realizado no Brasil teve importantes limitações metodológicas, por se utilizar de um desenho quasi-experimental, sem coleta de dados no baseline, ou seja, o estudo comparou o uso de drogas em um grupo que recebeu o currículo PROERD/DARE 4 anos antes, com outro grupo que não recebeu o programa, sem avaliar como era o padrão de uso dos grupos antes do início da aplicação do programano grupo intervenção.

Em 2014, a Policia Militar de São Paulo decidiu substituir o programa com resultados pouco favoráveis por um novo currículo importado, o Keepin' it REAL (KIR) (87). O KIR, com 10 aulas, foi adaptado para o Brasil e vem sendo implementado em salas de aula pelas polícias estaduais, para alunos de 5º e 7º ano do ensino fundamental II, utilizando-se de materiais didáticos e conteúdo específico para cada faixa etária (88,89).

Ao ser implementado nas escolas brasileiras, o KIR passou a ser intitulado "Caindo na Real". De acordo com o PROERD (90), responsável por esta adaptação e implementação, o programa de prevenção no Brasil é baseado na teoria de aprendizagem socioemocional (91,92), que trabalha com o desenvolvimento de habilidades de vida fundamentais para o aprimoramento emocional e relacional da criança e do adolescente, visando a promoção de saúde. As habilidades trabalhadas pelo currículo são especialmente a tomada de decisão, a comunicação interpessoal e relacionamentos, além da oferta de informações sobre drogas, bullying e técnicas de resistência (93,94), a serem descritas em maior detalhe na seção de "Métodos" deste projeto.

O currículo do programa foi desenvolvido pela incorporação de várias perspectivas teóricas: Teoria da competência de comunicação, que define esta competência como a relação de quatro componentes (conhecimento, motivação, habilidades e resultados) (95); Teoria narrativa, que sugere que as informações são melhor comunicadas através de histórias(96); Teoria com foco nas Normas, que entende que as crenças individuais e

coletivas interferem na decisão de usar drogas (97); e treinamento de habilidades sociais, que trabalha habilidades sociais de autogestão e de resistência às pressões sociais para usar drogas (98).

O KIR foi previamente testado em escolas dos EUA, onde apresentou resultados contraditórios, apesar de majoritariamente favoráveis ao programa, especialmente em populações latinas. Segundo uma revisão sistemática realizada recentemente (99), entre os alunos do 7o ano, a droga cujo consumo foi mais impactado pelo programa foi o álcool, tanto pela redução no relato de uso na vida (100), pela descontinuidade no uso (101), assim como na redução de quantidade de doses e dias de uso (102). Efeitos positivos do KIR foram encontrados também para e redução da iniciação(100) e do uso de cigarro (103–107) e maconha (107–111); e na redução no uso de outras drogas ilícitas (111). Por outro lado, um aspecto preocupante do programa é a ocorrência de potencial efeito iatrogênico, como o observado no estudo de Elek e colaboradores(112), que encontraram que os alunos que receberam intervenção no 5º ano aumentaram significativamente a prevalência de uso de substâncias (de 23% para 71%) no período de 3 anos quando comparados aos estudantes na condição de controle (de 30% para 63%). No mesmo sentido, Marsiglia e colaboradores(113) não encontraram efeito do programa na trajetória de uso de drogas dos estudantes quando aplicado apenas no 5º ano.

Assim, a sobreposição dos dois currículos se apresentou como outro fator a ser considerado no efeito positivo do programa, ou seja, os adolescentes se beneficiaram pela intervenção no 5º ano, apenas quando a mesma foi acompanhada de nova intervenção no 7º ano (114). Além disso, um possível moderador do efeito do programa identificado foi o desempenho escolar: os alunos com notas mais altas tiveram taxas de redução do consumo de álcool mais elevadas após exposição ao programa (115).

Do ponto de vista do efeito do programa na violência (104,107,116), apenas a versão em adaptada culturalmente e em espanhol que apresentou resultados favoráveis para diminuição de bullying (116). Há também importantes questões de fidelidade do programa que devem ser consideradas, como o número mínimo de 4 ou 5 vídeos a serem apresentados (102) e o tempo de aula, de 40-45 minutos, que nem sempre permite a completude das atividades previstas (94).

Em relação às adaptações culturais, Kulis e colaboradores (117) e Hecht e colaboradores (118) mostraram que as versões multiculturais, ou seja, as que abarcavam estudantes de origem latina, produziram uma gama mais ampla de efeitos desejados do que as outras versões, como a não latina, por exemplo (115), englobando uma série de mediadores de uso de substâncias e também aumento no repertório de estratégias de resistência (119).

No entanto, é preciso destacar que nenhum destes dados se referem a avaliações do currículo brasileiro PROERD/“Caindo na REAL”, baseado e adaptado a partir do programa KIR. Assim, em 2019, um estudo de avaliação da efetividade do Programa Educacional de Resistência às Drogas e à Violência (PROERD), currículo “Caindo na Real”, foi conduzido em São Paulo, através de dois ensaios controlados randomizados (um para 5º e outro para 7º anos). Ao contrário da maioria dos resultados do Keepin’it REAL, o PROERD/Caindo na REAL não teve efeito em retardar ou reduzir a iniciação e o consumo de drogas e, também, em relação ao bullying, para ambos os anos avaliados. Já os resultados das análises condicionadas de transição evidenciaram que os adolescentes que participaram do PROERD e que já bebiam em binge antes da intervenção, tiveram maior chance de manter este padrão de consumo quando comparados aos adolescentes que não participaram do programa (120). As análises para desfechos secundários mostraram efeitos positivos do programa na experiência escolar para os alunos do 7º ano,

porém, para os mesmos alunos, também foi encontrado aumento nas intenções de uso de cigarros e de aceitar maconha no futuro. Para o 5º ano o efeito também não foi favorável ao programa, já que houve redução nas habilidades de tomada de decisão entre os que fizeram o PROERD (121). Adicionalmente, em relação aos mediadores, foi encontrado que o PROERD não mudou as habilidades de tomada de decisão, as atitudes em relação às drogas e as habilidades de recusa e de comunicação (122). Assim, busca de uma melhor compreensão sobre os resultados encontrados na avaliação do PROERD, é necessário que sejam investigadas a aplicação do programa nas escolas participantes do estudo e, além disso, a visão dos policiais militares que o aplicam.

3. Justificativa

O Programa Educacional de Resistência às Drogas e à Violência (PROERD) tem sido aplicado em larga escala no Brasil, como uma política pública, desde 1992. O programa é coordenado e aplicado pelas Polícias Militares Estaduais e está presente em todos os estados do país, sendo o estado de São Paulo líder na formação de instrutores desde que foi trazido ao Brasil pela parceria entre PM e DARE-USA. Após 25 anos de aplicação sem a devida avalição de efetividade no país, em 2019 o programa teve sua efetividade avaliada a partir de um desenho de estudo padrão-ouro.

Do ponto de vista da saúde coletiva, a avaliação de resultados do programa PROERD contribuiu com informações importantes sobre os efeitos do programa nos estudantes para os comportamentos de uso de drogas e violência escolar, além dos mediadores e moderadores destes efeitos. O programa atingiu mais de 600 mil estudantes e, mesmo sendo o programa escolar mais disseminado no país, os resultados da avaliação de sua efetividade não foram satisfatórios, sendo necessário um aprofundamento nos fatores que podem corroborar para tais resultados.

Como complemento do estudo originalmente financiado pela FAPESP (2017/22300-7) e parte essencial para a compreensão dos fatores determinantes dos resultados encontrados no ECR, o presente estudo propôs a avaliação da fidelidade de implementação na efetividade do PROERD em escolas Estaduais da cidade de São Paulo e de seu efeito como mediador dos resultados do programa. É fundamental que seja melhor investigada a aplicação do programa, identificando possíveis aspectos que necessitem de adaptação e revisão junto à Polícia Militar.

Tais movimentos de aprofundamento da avaliação do programa e sua revisão são essenciais nesse ponto, em que temos evidenciada a falta de efetividade do programa. Porém, ele segue sendo aplicado, consequentemente, gerando gastos públicos, por

exemplo com impressão de materiais, e empenhando policiais que poderiam reforçar o policiamento na rua, mas estão nas escolas aplicando um programa que não possui resultados favoráveis.

4. Objetivos

4.1 Objetivo geral

- Avaliar a fidelidade de implementação do programa PROERD e seu possível impacto nos resultados de efeito do programa entre estudantes de 5 e 7 anos de escolas estaduais do município de São Paulo.

4.2 Objetivos específicos

- Avaliar o efeito da fidelidade de implementação do PROERD na prevenção do uso de drogas entre estudantes de 5 e 7 anos de escolas estaduais do município de São Paulo.

- Avaliar como e por que os instrutores alteram o programa PROERD, afetando a fidelidade de implementação.

5. Métodos

Esta pesquisa está vinculada ao projeto "Avaliação da Efetividade do Programa Educacional de Resistência às Drogas e à Violência (PROERD) da Polícia Militar do Estado de São Paulo", financiado pela Fapesp (processo número 2017/22300-7). Trata-se de um ensaio controlado randomizado, paralelo, com dois braços, entre alunos de 5º e 7º anos do ensino fundamental II de escolas públicas da cidade de São Paulo.

A presente tese se propôs a realizar a avaliação do processo de implementação do PROERD, no que tange à fidelidade, em escolas estaduais da cidade de São Paulo. A estratégia de pesquisa adotada para realizar esta análise do processo de implementação foi o estudo de métodos mistos, conforme proposto por Creswell (2009), utilizando instrumentos quantitativos e qualitativos com múltiplas fontes de dados, o que contribuiu para uma compreensão mais abrangente do processo de implementação do Programa Proerd (124,125).

Como se trata de dois estudos em paralelo, um de avaliação de efeito da fidelidade (ensaio controlado randomizado) de metodologia quantitativa e um de avaliação de fidelidade de metodologia qualitativa, faremos a descrição de cada um deles independentemente, justificando a análise de métodos mistos na sequência.

5.1 Intervenção

O programa PROERD/Caindo na Real foi aplicado aos alunos em sala de aula por policiais certificados e que já faziam parte da equipe regular de implementação do programa no Estado de São Paulo. Foram 10 lições (Quadro 1) guiadas por manual do aluno e do professor e tiveram, em média, 50 minutos de duração. A cada lição, foram realizadas de 1 a 3 atividades abordando o tema proposto no manual. Exemplos das atividades encontram-se no Anexo 1. Os policiais instrutores que ministraram o programa

foram capacitados em um treinamento de 40 horas oferecido pela Polícia Militar, sob orientação dos desenvolvedores norte-americanos (D.A.R.E. America).

O PROERD/Caindo na Real é composto por lições de autoconhecimento e autogestão; tomada de decisão responsável; habilidade de relacionamentos interpessoal e de comunicação. O manual do instrutor oferece informações sobre os procedimentos de cada aula, objetivos, materiais necessários, dicas e atividades a serem cumpridas. O manual do aluno oferece atividades que serão aplicadas pelo professor em cada aula. No Brasil, os materiais em inglês foram traduzidos para o português, com adaptação de expressões idiomáticas.

Quadro 1: Descrição das 12 lições do programa “Caindo na REAL” – PROERD, com seus objetivos e o título das atividades do 5º e 7º ano.

Lições	Atividades 5º ano	Objetivos 5º ano	Atividades 7º ano	Objetivos 7º ano
Lição 1	- Combinados PROERD - Praticando o modelo de tomada de decisão	•Definir o que significa ser responsável; •Identificar as suas responsabilidades em seu dia a dia; •Conhecer cada passo do Modelo de Tomada de Decisão Proerd (MTDP).	- Introdução ao REAL - Estratégias para recusar	• Identificar as estratégias de resistência para "Recusar, Explicar, Abster-se e Livrar-se" do currículo Proerd Caindo na REAL; • Definir os termos "Opção" "Escolha" e "Consequências"; • Explicar como as Escolhas geram Consequências; • Diferenciar em uma Simples Escolha e uma Escolha Sábia.
Lição 2	- Informações sobre bebidas alcoólicas - Informações sobre o cigarro - Situações de risco	• Identificar como o uso de álcool e de tabaco (cigarro) afeta as responsabilidades do aluno; • Examinar informações sobre o álcool e o tabaco (cigarro); • Compreender os efeitos do álcool e do tabaco (cigarro) sobre a saúde do corpo; • Usar o MTDP para definir o problema em cenários relacionados ao álcool ou ao tabaco (cigarro).	- O Jogo de adivinhações (Informações sobre drogas)	•Definir o significado da palavra "riscos"; •Identificar os riscos que podem ser potencialmente nocivos a eles; •Explicar como um risco pode afetar nossas escolhas.
Lição 3	- Fazendo escolhas seguras e responsáveis (consequências negativas e positivas)	• Definir riscos e consequências e aplicar os conceitos em situações reais; • Avaliar as consequências positivas e negativas nas escolhas feitas nas situações de risco; • Usar o MTDP para avaliar.	- Modelo de tomada de decisão PROERD - Histórias de conflitos	•Identificar e explicar os componentes do Modelo de Tomada de Decisão Proerd; •Explicar o que significa "Concordar em Discordar"; •Esclarecer as diferenças entre "Comportamento Assertivo", "Agressivo" e "Passivo".
Lição 4	- Estratégias de resistências - Respondendo à pressão	• Definir pressão dos colegas; • Reconhecer quais são as fontes de pressão dos colegas;	- Recusar assertivamente	• Explicar a estratégia para recusar; • Articular o advérbio "não" de forma clara; • Demonstrar técnicas assertivas verbais e não verbais.

		• Identificar formas de responder à pressão dos colegas; • Usar o MTDP para criar respostas à pressão dos colegas.		
Lição 5	- Sinais de tensão - Quais são algumas atividades positivas de que você gosta? - Avaliando sua decisão	• Identificar possíveis sinais de tensão; • Reconhecer os sinais de tensão; • Usar o MTDP para avaliar as situações de tensão.	- Explique utilizando frases afirmativas iniciadas com o pronome EU	• Definir a estratégia REAL para "Explicar"; • Expor suas razões de forma clara e objetiva; • Articular-se verbalmente para expressar suas preferências pessoais, usando frases afirmativas iniciadas com pronome "eu".
Lição 6	- Estilos de comunicação - Comunicação confiantes - O que eles deveriam fazer?	• Definir e explicar a importância da comunicação na vida diária; • Demostrar a comunicação confiante; • Usar o MTDP para avaliar e criar opções alternativas de comunicação eficiente.	- Cenários para abster-se	• Defi nir a estratégia REAL para "Abster-se"; • Listar as três maneiras que podem ser utilizadas para se abster de uma situação.
Lição 7	- Minha redação PROERD	• definir comportamentos eficazes de escuta enfática; • demonstrar escuta efetiva usando comportamentos verbais e não verbais; • usar o MTDP para avaliar e criar opções alternativas de comunicação eficiente.	- Cenários de livrar-se	• Explicar a estratégia REAL para "Livrar-se"; • Identificar situações em que poderão usar a estratégia "Livrar-se".
Lição 8	- Cinco perguntas para relatar o Bullying - Relatando o Bullying com responsabilidade	• Definir e reconhecer as características do bullying; • Identificar comportamentos de bullying; • Diferenciar fofocar de confidenciar; • Usar o MTDP para praticar maneiras seguras de relatar o bullying.	- Senso comum - Tomada de decisão pessoal	• Definir os termos "Senso-comum" e o "Senso comum entre colegas"; • Identificar o "Senso comum" sobre o uso de drogas entre seus colegas; • Explicar como "Senso-comum" pode influenciar suas decisões.
Lição 9	- Caça-palavras PROERD	• Identificar a importância de ser um bom cidadão;	- Cenários para encenação	• Reconhecer que as pessoas expressam suas emoções de formas diferentes; • Verbalizar porque seus sentimentos são válidos;

	- Relatando com segurança (Bullying no ônibus escolar)	• Reconhecer a importância de relatar o bullying a um adulto na escola ou em casa; • Demonstrar o uso do MTDP para relatar comportamentos de bullying; • Reforçar a sabedoria e os comportamentos positivos como meios de parar o bullying.		• Reconhecer que outras pessoas têm sentimentos diferentes.
Lição 10	- Precisando de ajuda - Minha rede de ajuda	•Identificar pessoas do relacionamento do aluno às quais ele pode recorrer se precisar de ajuda; •Relembrar os termos chave que foram aprendidos anteriormente.	- Eco mapa (rede de apoio)	• Explicar o conceito de rede de suporte social; • Identificar os membros da sua rede pessoal de suporte social; • Revisar e discutir conceitos chave no currículo Caindo na REAL.

Fonte 1PROERD, 2013; PROERD, 20

5.2 Estudo quantitativo (efeito da fidelidade)

5.2.1 Amostragem do ECR

Pelo fato de dois currículos distintos estarem sendo aplicados nas escolas, houve necessidade de cálculo de duas amostras, visto que a análise dos resultados foi independente, pois o conteúdo do programa ofertado em cada ano é diferente.

Para o 7º ano, de acordo com os resultados obtidos pela aplicação do KIR nos EUA, esperou-se uma redução de cerca de 20% na prevalência de uso recente de maconha, quando comparado ao crescimento de consumo no período de 6 meses entre o grupo controle e intervenção (101,114). Tomando por base as diferenças de prevalência na mesma faixa etária durante 9 e 21 meses de aplicação do programa #Tamojunto e as baixas prevalências (1%) de consumo de maconha, o melhor estimador para o cálculo da amostra é a iniciação do uso de álcool (46).

Foi utilizado o programa PASS 15.0, em seu módulo de cálculo de amostras em cluster para ensaios controlados randomizados (cluster randomized design) para teste de duas proporções, que tem por base a equação de Donner e Klar (126). Assim, para um poder de 80%, um nível de significância de 5%, uma diferença de proporções de 7% e uma correlação intraclasse de 0,02, o tamanho de amostra calculado foi de pelo menos 804 alunos, distribuídos em 12 clusters de pelo menos 67 alunos para cada grupo do estudo (intervenção e controle). Assim a amostra mínima do estudo seria 1608 alunos (804 em cada grupo). No entanto, considerando que cada escola tem de 70 a 90 alunos, em média no sétimo ano, no tempo inicial serão sorteadas aleatoriamente 24 escolas (12 controles e 12 intervenções) com três salas de 7º ano cada, totalizando uma amostra inicial de aproximadamente 2.160 alunos, permitindo assim, cerca de 25% de perda no follow up.

Para o 5º ano, considerou-se como desfecho principal aos 11 anos a escala de bullying (127) pois o uso de drogas é muito pequeno nesta faixa etária (128), buscando um tamanho de efeito mediado (entre 0,3 e 0,4 na diferença de médias).

Novamente, foi utilizado o programa PASS 15.0, em seu módulo de cálculo de amostras em cluster para ensaios randomizados (cluster randomized design). No caso do bullying, uma escala de 35 pontos, o cálculo de diferença para duas proporções em cluster (129) prevê um poder de 80%, um nível de significância de 5%, um tamanho de efeito de 0,3 e uma correlação intraclasse de 0,02. Para estes estimadores, o tamanho da amostra calculada foi de 13 clusters de 70 alunos em cada braço. Assim a amostra mínima do estudo seria de 1820 alunos. No entanto, considerando-se que cada escola tem de 70 a 90 alunos, em média, no quinto ano, no tempo inicial serão escolhidas aleatoriamente 26 escolas (13 controles e 13 experimentais) com três salas de 5º ano cada, totalizando uma amostra inicial de 2340 alunos, permitindo assim, cerca de 25% de perda no follow up.

A partir dos cálculos amostrais para o 7º e 5º ano, teríamos um total de 36 turmas recebendo o programa. Porém, na prática, tivemos 35 turmas do 5º ano e 47 turmas do 7º ano.

As escolas foram randomizadas a partir do universo de escolas públicas utilizando-se a lista de registro nacional de escolas do INEP – Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. O critério de inclusão para o sorteio foi a não aplicação do programa PROERD nas escolas nos últimos 3 anos. Assim, foram parte do universo amostral, todas as escolas estaduais do município de são Paulo que não aplicaram PROERD nos últimos 3 anos. Esta restrição visou reduzir a possibilidade de contaminação do estudo, já que escolas em que tem sido aplicado o PROERD regularmente podem já sofrer algum efeito crônico de exposição no ambiente escolar que poderia confundir o resultado do estudo. A unidade de randomização entre os grupos são

as escolas e não as turmas. Assim sendo, não houve turmas controle em uma escola intervenção e vice-versa.

5.2.2 Coleta de dados

Tanto o grupo controle quanto o grupo intervenção responderam a um mesmo questionário eletrônico. O questionário foi disponibilizado aos alunos através de smartphones por pesquisadores vinculados à UNIFESP, sem a presença do professor ou policial em sala de aula e foi de autopreenchimento. O mesmo questionário foi aplicado nos dois momentos de coleta de dados. Antes de aplicar o questionário, foi preenchido um código de sala e escola pelos pesquisadores de campo. Este código permitiu análises de cluster (multinível) em dois níveis (escola e classe). Experiências prévias da equipe com este modelo de código sigiloso para pareamento no tempo (128,130) evidenciaram aproveitamento de 90% dos questionários através do algoritmo de Levenshtein (1965).

Um aplicativo foi criado para o preenchimento do questionário em aparelhos celulares. Foi realizada uma aplicação piloto do instrumento nos celulares em três escolas públicas de São Paulo, onde foram identificadas necessidades de alteração do aplicativo. Como muitos alunos, principalmente do 5º ano, não sabem ler e apresentam dificuldades de interpretação, houve demora no preenchimento das respostas, passando muito do tempo previsto. Assim, para que o questionário fosse mais adequado às dificuldades dos alunos e viabilizasse a coleta, todas as questões foram gravadas e os áudios foram incluídos no aplicativo, juntamente com imagens nas alternativas de respostas. Após inserção virtual dos dados, a coerência interna das respostas foi testada através de análises de consistência, no intuito de identificação de questionários incompletos ou mal preenchidos propositalmente. Caso o aluno tenha deixado mais de 30% do questionário em branco, ele foi excluído.

Para a obtenção dos dados referentes à avaliação do efeito da fidelidade, a amostra foi composta por todos os 19 policiais instrutores do programa que participaram na aplicação das aulas do programa no ECR, os quais preencheram os formulários aula a aula (Anexo 2). Foi utilizada uma adaptação de formulário de fidelidade utilizado na avaliação de processo do programa de prevenção ao uso de drogas europeu Unplugged (132). Ele foi composto por 10 formulários online distintos para cada ciclo de aplicação do programa, para os dois anos (5º e 7º anos). Nestes, foi possível registrar: o número de participantes em sala, o tempo da lição, as atividades aplicadas em cada lição (de acordo com as atividades previstas) e houve espaço para que os instrutores registrem quaisquer acontecimentos que fujam do protocolo do Proerd. Semanalmente, a pesquisadora responsável lembrou os instrutores, via whatsapp, do preenchimento dos formulários.

5.2.3 Instrumentos e variáveis

O instrumento utilizado para a coleta de dados do ECR (Anexo 3) foi planejado a partir de instrumentos previamente utilizados em estudos de avaliação do efeito de programas de prevenção ao uso de drogas tanto no Brasil (128,130) como no exterior (47). Um dos instrumentos de base foi testado pela EU-DAP e utilizado nos estudos prévios de efetividade do Unplugged (47). No Brasil foi utilizada uma versão traduzida e adaptada para o português (133), com algumas questões substituídas por perguntas feitas a partir de dois questionários amplamente utilizados em diversos estudos entre estudantes no Brasil: o questionário da Organização Mundial da Saúde, utilizado pelo CEBRID no VI Levantamento do uso de drogas entre estudantes(134) e o questionário da PENSE (Pesquisa Nacional de Saúde do Escolar) utilizado pelo Ministério da Saúde (135).

Para pareamento dos questionários nos dois tempos do estudo, os alunos preencheram o código secreto na primeira tela do questionário que envolve a geração de letras e números a partir das seguintes informações: nome, sobrenome, data de nascimento, nome

da mãe, nome do pai e nome da avó materna. Desta maneira, cada código foi composto por 5 letras e 1 número e só poderá ser decodificado pelo próprio aluno. Esses códigos permitiram o pareamento dos questionários individuais nos diferentes tempos do estudo e, ao mesmo tempo, protegeram os participantes, oferecendo anonimato e confidencialidade essencial a um estudo sobre comportamentos ilícitos (136).

Os dados quantitativos sobre fidelidade de implementação foram coletados através de questionários online preenchidos pelos instrutores após cada aula, onde eles relatavam se as atividades programadas foram realizadas (sim ou não) e se alguma atividade foi alterada (sim ou não). Os formulários listavam todas as atividades planejadas para cada aula do programa, com base no manual do estudante. A pesquisadora responsável treinou os policiais para o preenchimento do formulário. Cada item tinha dados sobre a porcentagem de completude da atividade (o numerador era o número de atividades entregues, e o denominador foi o número total de atividades planejadas) e porcentagem de alterações (o numerador foi as atividades instrutores relataram mudanças, e o denominador foi o número de atividades planejadas). Uma variável de fidelidade para cada turma foi calculada da seguinte forma: fidelidade = % completude × (1-% alteração). As turmas foram então divididas em dois grupos de acordo com o nível de fidelidade: aqueles que receberam ≥ 80% das atividades propostas do PROERD foram consideradas que receberam o programa completo (alta fidelidade), enquanto os que receberam <80% das atividades receberam o programa incompleto (baixa fidelidade).

Como avaliamos 35 turmas de 5º ano e 47 turmas de 7º ano, e foi esperado o preenchimento de 10 formulários de fidelidade de cada turma (1 para cada uma das 10 aulas ministradas), esperávamos um total de 350 e 470 formulários para turmas de 5º e 7º anos, respectivamente. No entanto, alguns instrutores não retornaram todos os formulários, resultando em 47 (13%) formulários perdidos do 5º ano e 83 (17,66%) do

7º. A utilização de uma plataforma online para o preenchimento dos formulários permitiu que os pesquisadores marcassem todas os respostas como “obrigatórias”, evitando assim respostas em branco. Os cálculos de completude e alteração foram proporcionais à informação disponível sem missings.

O desfecho analisado foi a prevalência do uso de drogas entre alunos do 5º e 7º ano nos últimos 6 meses antes da coleta de follow-up (sim ou não), incluindo álcool, tabaco, maconha, consumo excessivo de álcool, inalantes e cocaína (as duas últimas avaliadas apenas entre 7º anos). No follow-up, os adolescentes responderam perguntas como “Você bebeu bebidas alcoólicas em últimos seis meses?”. O consumo excessivo de álcool (binge) foi considerado consumir cinco ou mais doses de bebidas alcoólicas em uma única ocasião.

As variáveis de controle foram sexo (masculino/feminino), idade e status socioeconômico (SES). SES foi avaliado pelo instrumento da Associação Brasileira de Empresas de Pesquisa (ABEP), que considera o nível de escolaridade do chefe de família e os bens e serviços utilizados. A pontuação da ABEP varia de 1 a 100 pontos, graduada de A (mais alto) a D/E (mais baixo) de acordo com o corte estabelecido pontos: A (45–100 pontos), B (29–44 pontos), C (17–28 pontos) e D/E (0–16).

5.2.4 Análise dos dados

Características sociodemográficas, dados de uso de drogas passaram e dados obtidos dos formulários de fidelidade sobre a completude e alterações de aulas do PROERD passaram por análise descritiva, com variáveis categóricas expressas em números e porcentagens, e variáveis numéricas expressas como médias e desvios padrão. Em seguida, realizamos uma análise inferencial para avaliar a impacto da fidelidade de implementação do PROERD na redução uso de drogas na adolescência. Para os alunos

do 7º ano, o impacto da fidelidade de implementação do PROERD sobre álcool, cigarro, uso de maconha, inalantes e cocaína e consumo excessivo de álcool nos últimos 6 meses foi examinado por um estudo modelo linear de efeitos mistos. Este modelo considera a variabilidade dentro indivíduos (desde o início até o acompanhamento) e entre indivíduos (crianças dentro de escolas), destacando relações entre a resposta observada e a explicação covariáveis (137). Dada a prevalência extremamente baixa do uso de drogas entre os alunos do 5º ano, esse impacto foi avaliado usando regressões logísticas. Todas as análises consideraram 0 como grupo controle, 1 como baixa fidelidade e 2 como alta fidelidade. A análise foi realizada usando o software STATA versão 17.0 e foi ajustada por sexo, idade e SES, considerando não independência da amostra (crianças aninhadas na escola).

5.3 Estudo qualitativo

5.3.1 Amostragem

Os 19 policiais instrutores do PROERD que participaram que implementaram a intervenção durante o ensaio controlado randomizado passaram por uma entrevista semi-estruturada. Também, houve observações da aplicação do programa nas 15 escolas do grupo intervenção, em uma turma de cada ano (5º e 7º), sendo as turmas sorteadas aleatoriamente e as lições observadas também foram aleatórias, somando 30 observações.

5.3.2 Coleta de dados

Foram utilizadas a técnica de observação da formação dos instrutores, observação da aplicação do programa em sala de aula e a técnica de entrevista individual para a avaliação da rotina de aplicação do programa pelos policiais instrutores.

A observação da formação dos instrutores foi realizada para que a pesquisadora responsável conhecesse o que e como é ensinado na formação. Assim, nas observações em sala de aula, ela saberia se o instrutor estaria agindo de acordo ou não com o que lhe foi passado e conseguiria discernir questões de cada instrutor em particular, de questões sistêmicas, vistas na formação. A pesquisadora acompanhou as 40 horas de formação de uma equipe de policiais.

As observações em sala de aula foram realizadas pela pesquisadora responsável nas 15 escolas do grupo intervenção. Foi acordado com cada policial instrutor os dias para as observações, que foram realizadas em uma turma aleatória de cada ano (5º e 7º). As aulas programadas para acontecer no dia acordado foram observadas e foram preenchidos os formulários de observações correspondentes às aulas. No mesmo dia, as entrevistas semiestruturadas foram realizadas com todos os instrutores.

5.3.3 Instrumentos e variáveis

Os dados qualitativos foram coletados por meio de entrevistas semiestruturadas (138), com um conjunto de perguntas, às quais o entrevistador estava livre para acrescentar novas perguntas se necessário. Para reduzir a interferência do entrevistador e facilitar a organização, comparação e análise, foi perguntado a todos os entrevistados o mesmo conjunto básico de perguntas (139). As entrevistas duraram cerca de 45 minutos e abordaram os seguintes tópicos: (i) como e por que os participantes se tornaram instrutores do PROERD; (ii) como eles percebem o efeitos (se houver) do programa; (iii) como é o relacionamento com a gestão escolar e como isso pode afetar o impacto do programa; (iv) se eles consideraram o treinamento do programa suficiente e como isso influenciou seu trabalho com o PROERD; (vi) suas opiniões sobre o material e seu conteúdo; (vii) quais atividades planejadas foram bem e mal recebidas; (viii) diferenças na aplicação dos currículos para alunos de 5º e 7º anos; (ix) como as exigências do

PROERD afetaram outras funções como policial e vice-versa; (x) o que eles mudariam no programa; (xi) o que poderia ser feito para melhorar a implementação do PROERD (Anexo 4). Todas as entrevistas foram gravadas com o consentimento prévio dos entrevistados. Os dados resultantes foram armazenados de garantindo o anonimato do entrevistado, transcritos e identificados por um código alfanumérico que combina a letra "P", para policial e um número aleatório, atribuído de acordo com a ordem das entrevistas (01, 02, 03…).

Também, a avaliação contou com formulário de observação da aplicação das lições (Anexo 5), o qual contava com questões abertas e fechadas. No questionário de observação aula a aula foi possível registrar a quantidade de alunos presentes, a aplicação das lições (tendo como base as orientações da formação de instrutores), se houve alguma alteração no protocolo original, e como foi a interação entre os envolvidos (instrutores com alunos e alunos entre si).

Quadro 2 Técnicas de coleta de dados, sujeitos, instrumentos

Tipo	Técnica	Participantes	Aplicado em	Instrumento	Variáveis
Qualitativa	Entrevista	Instrutores	Durante a aplicação do programa	Roteiro semiestruturado	Desenvolvimento das atividades de prevenção no Ambiente escolar; aspectos sobre o processo de implementação.
	Observação em sala	Instrutores e alunos	Durante a aplicação do programa	Questionário de observação com questões abertas e fechadas	Aplicação das lições, tamanho do grupo exposto, o estímulo do instrutor à participação do aluno, cumprimento das atividades, alterações nas atividades, estrutura física, material utilizado, domínio da aula e interação instrutor-aluno e aluno-aluno
Quantitativa	Formulário de Fidelidade	Instrutores	Final de cada lição ministrada	Questionário de autopreenchimento com questões abertas e fechadas	Total de alunos participantes em cada aula; Atividades realizadas; Tempo gasto em cada atividade; Envolvimento da turma; Elementos para modificar a interação entre alunos e instrutores.

5.3.4 Análises dos dados

Os dados das observações em sala de aula e das entrevistas foram submetidos à análise temática (140) usando codificação axial, em que categorias analíticas são geradas a priori com base nos tópicos do roteiro da entrevista, posteriormente vinculados para outras subcategorias ao longo das linhas de suas propriedades e dimensões (141). Dos 25 códigos identificados, escolhemos analisar 15 códigos com base na importância destes para a compreensão dos motivos para alterações do programa e possível influência na efetividade do PROERD e . A análise qualitativa foi executada usando ATLAS.ti © versão 7.5.4. Após codificação inicial, os dados foram submetidos triangulação interpretativa, analisando os dados em paralelo.

5.4 Ética

Este projeto, a exemplo de todos os que investigam seres humanos, foi submetido e aprovado do Comitê de Ética em Pesquisa (CEP) da UNIFESP. Respeitou em todos os momentos a voluntariedade na participação e o direito de não participar, sem prejuízo dos alunos quanto a seus benefícios de direito como cidadão comum ou qualquer impacto em suas relações com a escola ou família. Pelo fato de a intervenção ser inserida na escola como parte do currículo do 5º e 7º ano, a participação nas aulas não é optativa. No entanto, a participação na pesquisa, caracterizada pela resposta aos questionários nos dois tempos, não é obrigatória. Em nenhuma situação os pesquisadores disponibilizam os dados coletados com informações que possam identificar o participante da pesquisa e não disponibilizaram os dados individuais para as escolas, pais dos participantes do estudo ou a Polícia Militar. O ensaio foi registrado no REBEC (Registro de Ensaios Clínicos do Ministério da Saúde) sob número 6q23nk (http://www.ensaiosclinicos.gov.br/rg/RBR-6q23nk/).

6. Resultados

Decorrentes deste estudo, um artigo foi publicado (anexo 6) e um artigo será submetido à revistas indexadas internacionais:

1- Gusmoes, Julia D; Garcia-Cerde, Rodrigo; Valente, Juliana Y; Pinsky, Ilana; Sanchez, Zila M. Implementation fidelity of a Brazilian drug use prevention program and its effect among adolescents: a mixed-methods study. *Substance Abuse Treatment Prevention and Policy*, v. 17, p. 71, 2022.

2- Gusmoes, Julia D; Garcia-Cerde, Rodrigo; Sanchez, Zila M. Why and how Brazilian DARE-kiR instructors adapt the program during delivery: a qualitative implementation research approach. Submetido à *Drugs: Education, Prevention and Policy*

Durante o doutorado, outros artigos também foram produzidos com colaboração da pesquisadora, listados a seguir apenas a título de conhecimento:

Valente, Juliana Y.; Galvão, Patricia Paiva De Oliveira ; **Gusmoes, Julia Dell Sol Passos**; Sanchez, Zila M. . A systematic review of the effect of the school-based drug prevention program Keepin? it REAL: translated and implemented in Brazil by PROERD. *Ciência & Saúde Coletiva*, v. 27, p. 4175-4189, 2022.

Ferreira-Junior, Valdemir ; Coutinho-Lourenco, Fausto ; Menezes, Alessandra A. S. ; **Gusmoes, Julia Dell** ; Cogo-Moreira, Hugo ; Sanchez, Zila M. . Psychometric validation of the audio-guided rBVQ instrument for bullying evaluation among students. PSICO-USF, v. 27, p. 381-392, 2022.

Cogo-Moreira, Hugo **; Gusmões, Julia D.** ; Valente, Juliana Y. ; Eid, Michael ; Sanchez, Zila M. . Does #Tamojunto alter the dynamic between drug use and school

violence among youth? Secondary analysis from a large cluster-randomized trial. *European Child & Adolescent Psychiatry*, p. 1, 2021.

Sanchez, Z.M. ; Valente, Juliana Y. ; Junior, V ; **Gusmoes, J. D.** ; Caetano, S. ; Cogo-Moreira, Hugo ; Andreoni, S. . Effectiveness of a school-based substance use prevention program taught by police officers in Brazil: Two cluster randomized controlled trials of the PROERD. *International Journal of Drug Policy*, v. 98, p. 103413, 2021.

6.1 Artigo 1

Implementation fidelity of a Brazilian drug use prevention program and its effect among adolescents: a mixed-methods study

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Abstract

Background: Based on the US DARE-kiR, a version of the Keepin' it REAL program, the Drug and Violence Resistance Educational Program (PROERD) is the most widely implemented Brazilian prevention program. It originates from the translation of the DARE-kiR, a version of the Keepin' it REAL program. Previous results suggest its inefficiency in preventing drug use among Brazilian adolescents. Since kiR fidelity can impact program outcomes, this mixed-methods study evaluates the PROERD implementation fidelity and its effects on preventing drug use among adolescents. **Methods:** Data from two cluster randomized controlled trials (cRCTs) with 4,030 students from 30 public schools in São Paulo (1,727 fifth graders and 2,303 seventh graders), assessed at two-time points, were analyzed quantitatively. After implementing each lesson during the cRCT, 19 PROERD instructors answered fidelity forms. The effect of PROERD fidelity on alcohol, cigarettes, marijuana, inhalant, and cocaine use (the last two only among seventh graders) in the six months prior to follow-up assessment was analyzed by logistic regressions for fifth grade and mixed effect models for seventh graders. For qualitative analysis, semi-structured interviews were conducted with PROERD instructors and investigated by thematic analysis. **Results:** Quantitative analysis showed that PROERD implementation fidelity had no impact on drug use among fifth and seventh graders. Conversely, the qualitative analysis revealed important aspects that may influence implementation fidelity and consequently program effectiveness, such as adaptations made by instructors, school infrastructure, among others, besides program application. **Conclusion:** PROERD requires cultural adaptation to improve its implementation in Brazilian public schools. **Trial registration:** Study registered in the Brazilian Ministry of Health Register of Clinical Trials (REBEC) under protocol no. 6q23nk.

Keywords: implementation fidelity; prevention; mixed-methods; adolescent; school; drugs.

Introduction

Adolescence is the typical period during which initial alcohol and drug use occurs (1), impacting mental health (2) and facilitating the development of drug-related issues (3), as well as drug dependence in adulthood (4). Hence, alcohol use in early adolescence is an important public health concern (5), contributing to the global disease burden (6).

Among Brazilian adolescents between 13 and 15 years of age, 55.5% reported alcohol consumption and 9.0% had used illicit drugs at least once in their lives, whereas 22% reported episodes of drunkenness (7). Despite being a major public health concern, few evidence-based programs for drug use prevention have been implemented and proven efficacious in Brazilian schools (8). The Drug and Violence Resistance Educational Program (Programa Educacional de Resistência às Drogas e à Violência – PROERD) is the most widely implemented school-based prevention curricula, reaching approximately 40% of schools (8). A recent study showed that PROERD failed to achieve better preventive drug outcomes in the intervention group compared to the control group for both 5th and 7th grades (9). Moreover, the program appears to negatively impact secondary outcomes, as the seventh grade curriculum seems to increase the intention to use cigarettes in the future and chances of accepting marijuana, whereas the fifth grade curriculum slightly reduces decision-making skills (10).

Its current curriculum is a Brazilian Portuguese translation of the US DARE-Keepin'it REAL (DARE-kiR) program (11), renamed as "PROERD-Caindo na Real," and implemented by military police officers in all Brazilian states. Of wide implementation in US schools, DARE-kiR is also enforced by the military police.

However, no studies have reported its impact on drug use prevention (12). The only published paper reporting DARE-kiR findings is a quasi-experimental matched group study that looked at its impact on secondary outcomes (11). Prior to adaptation by DARE, kiR was originally designed and developed to be implemented in 7th grade classrooms by their teachers. The original program was tested with 7th graders in Arizona-USA (13),and its culturally adapted versions were also evaluated by multiple RCTs in the US and in other countries (14–17), showing consistently positive results. As the kiR program for fifth graders proved to be ineffective, its developers recommended continued intervention only for 7th grades (18,19). Randomized control trial (RCT) evaluations of the kiR seventh grade curricula have shown consistently favorable results on drug use prevention in the US (13), Guatemala (14), Mexico (15), and Spain (17). RCT evaluations of the kiR seventh grade curriculum have reported positive outcomes for discontinuing alcohol use (20) and intoxication episodes (17), as well as preventing cigarette (16,21), marijuana (14,16,22) and other illicit drugs (15,22) use. Conversely, kiR fifth grade curricula remain poorly investigated, and the only RCT reported a significantly increase in the prevalence of substance use over the 3-year period (19). Despite the scarcity of reports on DARE-kiR implementation, some studies measured and reported findings on kiR fidelity. Marsiglia et al (23,24) reported findings on fidelity in the context of cultural adaptation of the program to the Mexican population, as well as Cutrin to the Spanish population (17). The only study that we are aware of that has investigated the impact of kiR implementation fidelity on programs outcomes found that the program's impact on positive outcomes can increase based on delivery quality (25). PROERD and DARE-kiR are a translated version of the same program, share the same theoretical model of their original version (kiR program). The main difference between the programs is that kiR is

implemented by teachers, and DARE-kiR and PROERD are implemented by police officers.

Considering these unexpected results from the Brazilian version of the DARE-kiR program, we must investigate which factors might be affecting the outcomes. One factor that reportedly impacts a prevention program's effectiveness is the excellence (or lack thereof) of its implementation (26), which can be determined by implementation fidelity, that is, the degree to which an intervention and its core components are delivered as intended by the program developers (27,28). A crucial aspect of implementation, that provides important information for measuring fidelity, especially when the program is not implemented by researchers, is the dosage, that is, the amount of program delivered (29). In a review, Hill and Erickson (30) found that implementation fidelity plays an important role in program outcomes, as programs delivered with high or moderate levelsof fidelity show more than double the potential to achieve positive results, contradicting the null outcome seen in our study. Despite the scarcity of reports on DARE-kiR implementation, a study investigating kiR implementation fidelity found that its impact can increase based on the quality of delivery (25).

According to Pettigrew et al. (31), teachers may adapt the program to their teaching characteristics. Such adaptation of evidence-based programs, that is, modifying the design or delivery of an intervention to address cultural and contextual specificities, can impact their results (32). However, the relation between fidelity and adaptation remains controversial, with some researchers arguing that practices implemented with high fidelity result in better outcomes (33), while others highlight the importance of balancing between fidelity and flexibility for a successful interventions (34). These findings point to the importance of identifying aspects that may require adaptation, as

previously done among populations in Guatemala (35) and Mexico (23), as well as in rural communities in Pennsylvania and Ohio (25).

Given the relevance of implementation fidelity to better program outcomes, we hypothesized that PROERD delivered with high fidelity would have a better effect among students. Hence, this study sought to evaluate, by quantitative and qualitative methods, the PROERD implementation fidelity and its effect on drug use prevention.

Methods

Of a mixed-methods design, the study obtained quantitative data from two cluster randomized controlled trials (cRCTs) and collected qualitative data using 1) questionnaires applied to cRCTs participants, 2) fidelity forms answered by instructors (police officers) after each cRCT lesson, and 3) semi-structured interviews conducted with the instructors who delivered lessons. The interviews and qualitative analysis allowed us to answer research questions and clarify cRCT findings and quantitative results (36).

Intervention

The school-based "PROERD-Caindo na Real" program consists of 10 weekly classes (50 minutes each) delivered by trained police officers in the classroom environment, using student and teacher manuals. The police officer responsible for teaching the class uses the teacher's manual, which provides information on procedures, objectives, materials needed, and tips for each lesson, including 1-3 activities. All participating officers underwent 80 hours of training offered by the Military Police under the guidance of DARE America. Fifth and seventh graders were taught by the same instructor. All curricula were developed based on theories of narrative engagement (37), the principle of cultural grounding (38), social and emotional learning (39), and normative

beliefs on drug use (40). In Brazil, the program is implemented by the Military Police. Despite the lack of information about the program's cultural adaptation process, a comparative reading of the DARE-kiR and PROERD manuals suggests that the latter is simply a translation into Brazilian Portuguese of the DARE material, lacking cultural and socio-environmental elements specific to the Brazilian context. Thus, its effectiveness needs to be assessed considering this factor.

Quantitative methods

cRCT study design

Two parallel two-arm cRCTs were conducted with 4,030 fifth and seventh graders from 30 public schools in São Paulo in 2019 to evaluate the PROERD curricula for drug use prevention. Of these, 1,727 were fifth graders enrolled in 72 classes at 28 schools, and 2,303 were seventh graders enrolled in 90 classes at 30 schools. Both intervention groups attended 10 classes taught by 19 trained police officers; the control group received no intervention. State schools in the municipality of São Paulo that offered 5th and 7th grade and had not received PROERD in the last three years were included in the randomization. The first 30 schools listed were considered the study sample and the following 29 schools were included as backup in case of refusal. In the schools that agreed to participate in the study, all 5th and 7th graders participated in the cRCT. Sample size calculation, school selection, and the randomization process were performed according to Valente & Sanchez (10).

First data source: questionnaires applied to cRCT participants

Data were collected at two-time points. Baseline assessment was conducted prior to program implementation between February and March 2019. As the Brazilian academic year usually runs from February to December, follow-up data were collected 9 months after baseline in November and December 2019. Control and intervention data

were collected simultaneously. An anonymous, self-administered audio-guided questionnaire was applied to students using smartphones by researchers in the classroom without a teacher. This instrument has been employed in previous studies to evaluate school-based drug prevention programs in Brazil (41,42). It was designed based on the European Drug Addiction Prevention Trial (EU-DAP) questionnaire (43), translated and adapted into Brazilian Portuguese. We added a few questions from the World Health Organization (WHO) questionnaire, used in the VI Brazilian Survey on Drug Use among Students (44), and the National Survey of School Health (PENSE) questionnaire, from the Ministry of Health (45).

The outcome analyzed was the prevalence of drug use among fifth and seventh graders in the past 6 months before the follow-up assessment (yes or no), including alcohol, tobacco, marijuana, binge drinking, inhalants, and cocaine (the last two assessed only among seventh graders). During follow-up, the adolescents answered questions such as “Have you drunk alcoholic beverages in the past six months?” Binge drinking was considered as the consumption of five or more alcoholic beverages on a single occasion.

Control variables consisted of sex (male/female), age, and socioeconomic status (SES). SES was assessed by the Brazilian Association of Research Companies (ABEP) scale, which considers the schooling level of the head of the household and the goods and services used. ABEP score ranges from 1 to 100 points, graded from A (highest) to D/E (lowest) according to established cutoff points: A (45–100), B (29–44), C (17–28), and D/E (0–16) (46).

In each assessment, students provided a code generated from letters and numbers of their personal information, which allowed to match pre- and post-tests, ensuring anonymity and confidentiality, as used previously in drug prevention program evaluations (47). Since some students may overreport their drug use, we included questions related

to fictional drugs called “holoten” and “carpinol.” Questionnaires positive for lifetime use of these drugs were excluded from the analysis (14 and 12 questionnaires at baseline and 11 and 8 questionnaires at follow-up for fifth and seventh graders, respectively).

Second data source: fidelity forms answered by instructors

Data on implementation fidelity were collected using self-administered online questionnaires completed by the instructors after each lesson, reporting whether the scheduled activities were delivered (yes or no) and whether any activities were altered by the instructors (yes or no). The fidelity forms listed all activities planned for each program lesson, based on the teacher’s manual. The first author (J.D.G.) trained the police officers on how to fill the form. Each item had data on the percentage of activity completeness (the numerator was the number of activities delivered, and the denominator was the total number of activities planned), and percentage of alterations (the numerator was the activities instructors reported changing, and the denominator was the number of activities planned). A fidelity variable for each class was calculated as follows: fidelity = % completeness × (1-% alteration). Classes were then divided into two groups according to the level of fidelity: those that received ≥80% of the proposed PROERD activities were considered to have completed the program, whereas those that received <80% of the activities were considered to have incomplete implementation.

Since we evaluated 35 fifth grades and 47 seventh grades, and awaited 10 fidelity forms from each class (1 for each of the 10 lessons delivered), we expected a total of 350 and 470 forms for fifth and seventh grade classes, respectively. However, some instructors failed to return the forms, resulting in 47 (13%) and 83 (17,66%) fifth and seventh grade forms not delivered and considered missing. Online completion allowed researchers to mark all responses as “mandatory,” thus avoiding missing answers.

Completeness and alteration calculations were proportional to the information available without missing data.

Qualitative methods

After the intervention, data were collected by semi-structured interviews conducted with all 19 PROERD instructors involved in the cRCT (19 instructors delivered the program in 30 intervention schools).

Third data source: semi-structured interviews with instructors

Qualitative data were collected by semi-structured in-depth interviews (48), with a set of previously defined questions, to which the interviewer was free to add new questions if necessary. To reduce interviewer interference and facilitate data organization, comparison, and analysis, all interviewees were asked the same basic set of questions (49).

Interviews lasted around 45 minutes and touched on the following topics: (i) how and why the participants became a PROERD instructor; (ii) how they perceive the effects (if any) of the program; (iii) their relationship with the school counselor and how it could affect the program's impact; (iv) whether they considered the program training sufficient and how it influenced their work in PROERD; (vi) their opinions on the material and its content; (vii) what planned activities were well and poorly received; (viii) differences in applying the curricula for fifth and seventh graders; (ix) how PROERD demands affected other officer duties and vice versa; (x) what they would change in the program; (xi) what could be done to improve PROERD implementation. All interviews were recorded with prior consent from the interviewees. The resulting data were anonymized, transcribed verbatim, and identified by an alphanumeric code combining the letter (P), for police officer, and a random number assigned according to the order of the interviews (01, 02, 03…).

Data analysis

Quantitative analysis

Sociodemographic characteristics and drug use data underwent descriptive analysis, with categorical variables expressed as numbers and percentages, and numerical variables expressed as means and standard deviations. We then performed inferential analysis to assess the impact of PROERD implementation fidelity on reducing adolescent drug use. For seventh graders, the impact of PROERD implementation fidelity on alcohol, cigarette, marijuana, inhalants, and cocaine use and binge drinking in the past 6 months was examined by a mixed-effects linear model. This model considers variability within individuals (from baseline to follow-up) and between individuals (children nested in schools), highlighting the relations between the observed response and explanatory covariates (50,51). Given the extremely low prevalence of drug use among fifth graders, this impact was assessed using logistic regressions. All analyses considered 0 as control group, 1 as low fidelity, and 2 as high fidelity. Analysis was performed using STATA software version 17.0 and adjusted for sex, age, and SES, considering non-independence of the sample (children nested in school).

Data obtained from the fidelity forms on the completeness and alterations of PROERD lessons were underwent descriptive analysis, summarized as numbers and percentages.

Qualitative analysis

Data underwent thematic analysis (52) using axial coding, in which a priori analytical categories were generated based on interview guide topics, subsequently linked to other subcategories along the lines of their properties and dimensions (53). Of the 25 codes identified, we chose to analyze 8 codes based on their possible influence on PROERD effectiveness (see Figure S1), organized into 3 topics: 1) adaptations, 2)

accumulation of functions, and 3) school infrastructure. Qualitative analysis was performed using ATLAS.ti © version 7.5.4.

After initial coding performed by the first author (J.D.G.), a PhD candidate in public health with training and experience in qualitative analysis, data underwent interpretive triangulation by the second author (R.G.C.), an anthropologist and PhD candidate in collective health, who analyzed the data in parallel. Disagreements were resolved by discussions, and a second review of the interview transcripts. Topics reported and discussed in this manuscript resulted from a consensus among researchers.

Results

Quantitative analysis

Among fifth graders, 1,727 students answered the baseline questionnaire and 1,334 the follow-up questionnaire (77.24%). Among seventh graders, 2,303 students answered the baseline questionnaire and 1,739 the follow-up questionnaire (75.51%) (**Figure 1**).

Table 1 summarizes the characteristics of the fifth and seventh graders who participated in the cRCT baseline assessment. At baseline, the intervention and control groups were homogenous in terms of sex, age, and SES (see **Table S1** and **Table S2** in the Supplementary File). The attrition analysis found no significant difference between groups and between sex. As expected, however, students who missed the 9-month follow-up showed a significantly higher prevalence of substance use at baseline, especially among 7th graders (42). **Table 2** presents the descriptive results of drug use at follow-up according to group and level of implementation fidelity. Alcohol was the most commonly used drug in both grades and groups.

As for program implementation fidelity, 37.1% of fifth grade classes received the program with high fidelity, with lesson seven (effective communication) being the most incomplete (20% completeness) and lesson three (making choices) the most altered (17.9% alteration). Similarly, 61.7% of seventh grade classes received the program with high fidelity, with lesson ten (eco map) being the most incomplete (67.5% completeness) and lesson four (assertive refusal) the most altered (21.6% alteration) (**Table 3**). We observed no effect of implementation fidelity on reducing drug use for either grade (see **Table 4 and 5**).

Qualitative analysis

Table S3 (Supplementary File) summarizes the interviewees' characteristics, and **Annex S1** (Supplementary File) presents the semi-structured interview script applied to police officers.

Findings were classified into three dimensions—adaptations, accumulation of functions, and school infrastructure—, corresponding to the eight codes. **Table 6** summarizes the respective golden quotes.

Adaptations: Of the 19 interviewed instructors, 15 reported adapting the program, usually spontaneously and based on individual perception of student's needs (without any systematics), such as reading and writing difficulties. Instructors also chose to adapt the program when lessons were thought to flow better if applied differently from the established program. We identified four types of adaptations to PROERD curricula: alterations according to student literacy, addition of content and/or activities, changes in curricula, and exclusion of content and/or activities.

Accumulation of functions: Accumulation of two functions strongly influenced the instructor's work. Police officers responsible for implementing PROERD do not necessarily leave their regular policing duties, which hinders the planned 10-week

application, as some officers may need to report for duty during class hours or because their shifts interfere with class preparation, thus impacting the intended program delivery. Only four instructors reported being rarely assigned to other activities besides the program, which facilitated their work as PROERD instructors. Of the remaining interviewees, 11 stated being assigned to other activities or experiencing a lack of support from their superiors, as they eventually missed classes due to other duties.

School infrastructure: According to the instructors, the reality of public schools in São Paulo makes it impossible to show videos included in the program's material, resulting in adaptations to the curriculum.

Discussion

This study analyzed the impact of PROERD implementation fidelity based on quantitative and qualitative methods. According to quantitative results, the level of implementation fidelity had no influence on the program's ability to reduce adolescent drug use. Conversely, the qualitative analysis revealed important implementation aspects that must be considered when examining the program outcomes, such as adaptations made by the instructors, accumulation of functions (police officers who are also PROERD instructors), and school infrastructure.

Contrary to previous literature, which suggested that implementation fidelity plays an important role in program outcomes (25,30), the present study found no influenceof implementation fidelity on PROERD results. Previous studies have addressed the importance of examining the program design and contextual factors to better understand null results (54,55). Our null findings may be explained by the lack of cultural adaptation of the program to the Brazilian context, which is corroborated by the interviews. Moreover, compared with students in 35 other member countries of the Organization for

Economic Cooperation and Development, Brazilian students' reading performance is below average (OECD, 2019; PISA, 2016), requiring a series of adaptations to the program curricula to ensure global understanding of the proposed lessons. As PROERD appears to be simply a translation of the DARE-kiR into Brazilian Portuguese, these findings highlight the importance of a reexamination by the Military Police of São Paulo, focusing on appropriate and structured cultural adaptation (56). In the absence of a well-designed, evidence-based cultural adaptation, instructors adapt program curricula according to their judgment, making it difficult to target core elements and consequently achieve the expected results (33).

The higher rates of low implementation fidelity suggest that instructors, when implementing evidence-based programs in schools, often encounter unpredictable situations that lead to changes in activities, such as lack of school infrastructure, affecting the level of implementation fidelity (31,33). Differences in implementation fidelity between fifth and seventh grades may stem from the fact that, in the state of São Paulo, PROERD is delivered mainly to fifth graders, which could lead to a greater adaptation, that is, the greater the knowledge about the curricula, the more instructors feel comfortable to adapt according to their previous experience (57). The challenge for researchers and developers of prevention programs is therefore to define core elements that are mandatory to achieve the expected outcomes (23,56), while allowing for some flexibility so the program can adapt its theoretical model to the local context and culture (34,56). As the fidelity forms used quantified only the lessons taught and ignored teaching quality (58), the quantitative analysis failed to assess important aspects of implementation. Hence, a mixed-methods approach allows one to evaluate details that would be lost when only one method is used (59).

Qualitative data revealed that instructors adapted the program curricula according to aspects such as student literacy, school infrastructure, and previous teaching experience, thus compromising implementation fidelity. Previous studies (60,61) have also found that teachers tend to adapt curricula according to their students' needs and vulnerabilities, such as reading proficiency and violence perpetration, which are prevalent issues in Brazilian public schools. In a study on teachers' adaptations of kiR curricula, Miller-Day et al. (61) reinforced that, as much as such adaptations are expected, training must instruct teachers on how to adapt without changing the core aspects of each lesson.

According to the Survey on the Use of Information and Communication Technologies in Brazilian Schools (62), most public schools lack computer labs and technological infrastructure, such as laptops or tablets. As the PROERD curricula for fifth and seventh grade require audiovisual resources, school infrastructure is essential for program implementation as developed by kiR creators. Warren et al. (63) state that kiR videos are essential for interventions to achieve positive outcomes. As such, PROERD implementation fidelity cannot be expected to play an important role, since core elements such as video materials are not delivered as planned.

According to Medeiros et al. (64), teachers who deliver prevention programs feel overburdened by program activities, which require planning and classroom preparation which consequently affects their regular curricular activities. Thus, implementation of a school-based program by outside individuals is likely to be a positive experience for teachers and for the school itself. Although PROERD is delivered by police officers, the interviews show that these instructors are equally burdened by this role, as they continue to perform other policing functions. Given the importance of implementation quality (33), developers must focus on program viability to ensure that the required activities do not

overburden instructors (from inside or outside the school setting) and compromise its quality (64).

In analyzing the interviews, it became evident that the null effect of implementation fidelity lies on the lack of cultural adaptation, as officers reported having to adapt the program to make implementation feasible due to student difficulties and school infrastructure.

Limitations

A first limitation to consider is that the schools selected to participate in the RCTs were located in the low-income regions of São Paulo, which experience high exposure to drug use (65); hence, instructors working in different areas could have distinct experiences and perceptions regarding the program. Since our sample consisted ofschools that did not receive any intervention in the three years prior to the study to ensurenon-contamination, the data cannot be generalized to all schools in São Paulo. Another limitation concerns the fidelity forms, which were subject to information bias due to self-reporting (29). Moreover, both the questionnaire and fidelity forms were measured by dichotomous answers, limiting the analysis. One final limitation is that we didn't use school achievement and other important predictors of drug use, such as mental health, family environment and drug access as control variables, which have strong predictive power for substance use.

Conclusions

This study is the first to evaluate PROERD implementation fidelity in Brazil, highlighting important considerations to improve is effectiveness and sustainability. Future studies examining these parameters should employ better reliable instruments to measure implementation fidelity (dosage and quality), such as class observations.

Moreover, future PROERD investigations must define which activity touches upon the core element of a lesson (61). PROERD instructors with a clear understanding of the essential elements to be taught is key, allowing them to adapt less important parts in a structured manner according to the audience. Given the country's territorial extent and its different realities, PROERD curricula must undergo a process of cultural adaptation. Moreover, the Military Police should incorporate the scientific findings regarding PROERD implementation in São Paulo and continue to investigate its effects not only in the city, but throughout the country.

List of abbreviations

ABEP - Brazilian Association of Research Companies

cRCT - Cluster Randomized Controlled Trial

DARE-kiR - DARE-Keepin'it REAL

EU-DAP - European Drug Addiction Prevention Trial

kiR - Keepin' it REAL

OECD - Organization for Economic Cooperation and Development

PENSE - National Survey of School Health

PROERD - Drug and Violence Resistance Educational Program (Programa Educacional de Resistência às Drogas e à Violência)

RCT - Randomized Control Trial

SES - Socioeconomic Status

WHO - World Health Organization

Declarations

Ethics approval: All procedures in the present study followed the ethical standards established by institutional and/or national research committees and the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Study registered in the Brazilian Ministry of Health Register of Clinical Trials (REBEC) under protocol no. 6q23nk (https://ensaiosclinicos.gov.br/rg/RBR-6q23nk). Study protocol was approved by the Research Ethics Committee of the Universidade Federal de São Paulo (No.1327/2018).

Consent to participate: All participants gave informed consent to participate in the study.

Consent for publication: Not applicable.

Availability of data and materials: Data and materials are available upon request.

Conflicts of interest: None.

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References

1. Bates MLS, Trujillo KA. Use and abuse of dissociative and psychedelic drugs in adolescence. Pharmacol Biochem Behav [Internet]. 2021;203:173129. Available from: https://doi.org/10.1016/j.pbb.2021.173129

2. Wittchen HU, Fröhlich C, Behrendt S, Günther A, Rehm J, Zimmermann P, et al. Cannabis use and cannabis use disorders and their relationship to mental disorders: A 10-year prospective-longitudinal community study in adolescents. Drug Alcohol Depend. 2007;88(SUPPL.1):60–70.

3. Kim MJ, Mason WA, Herrenkohl TI, Catalano RF, Toumbourou JW, Hemphill SA. Influence of Early Onset of Alcohol Use on the Development of Adolescent Alcohol Problems: a Longitudinal Binational Study. Prev Sci [Internet]. 2017;18(1). Available from: http://dx.doi.org/10.1007/s11121-016-0710-z

4. Hingson RW, Heeren T, Winter MR. Age at drinking onset and alcohol dependence: Age at onset, duration, and severity. Arch Pediatr Adolesc Med. 2006;160(7):739–46.

5. Hall WD, Patton G, Stockings E, Weier M, Lynskey M, Morley KI, et al. Why young people's substance use matters for global health. The Lancet Psychiatry [Internet]. 2016;3(3):265–79. Available from: http://dx.doi.org/10.1016/S2215-0366(16)00013-4

6. Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, et al. Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. Lancet. 2013 Nov;382(9904):1575–86.

7. IBGE - Instituto Brasileiro de Geografia e Estatística. Pesquisa Nacional de Saúde do Escolar 2015. Rio de Janeiro; 2016.

8. Pereira APD, Sanchez ZM. Characteristics of school-based drug prevention programs in Brazil. Cienc e Saude Coletiva. 2020;25(8):3131–42.

9. Sanchez ZM, Valente JY, Gusmões JDP, Ferreira-Junior V, Caetano SC, Cogo-Moreira H, et al. Effectiveness of a school-based substance use prevention program taught by police officers in Brazil: Two cluster randomized controlled trials of the PROERD. Int J Drug Policy [Internet]. 2021;98:103413. Available from: https://doi.org/10.1016/j.drugpo.2021.103413

10. Valente JY, Sanchez ZM. Short - Term Secondary Effects of a School - Based Drug Prevention Program : Cluster - Randomized Controlled Trial of the Brazilian Version of DARE ' s Keepin ' it REAL. Prev Sci [Internet]. 2021;(0123456789). Available from: https://doi.org/10.1007/s11121-021-01277-w

11. Day LE, Miller-Day M, Hecht ML, Fehmie D. Coming to the new D.A.R.E.: A preliminary test of the officer-taught elementary keepin' it REAL curriculum. Addict Behav [Internet]. 2017;74(November 2016):67–73. Available from: http://dx.doi.org/10.1016/j.addbeh.2017.05.025

12. Caputi TL, Thomas McLellan A. Truth and D.A.R.E.: Is D.A.R.E.'s new Keepin' it REAL curriculum suitable for American nationwide implementation? Drugs Educ Prev Policy [Internet]. 2017;24(1):49–57. Available from: http://dx.doi.org/10.1080/09687637.2016.1208731

13. Hecht ML, Marsiglia FF, Elek E, Wagstaff DA, Kulis S, Dustman P, et al. Culturally Grounded Substance Use Prevention: An Evaluation of the keepin' it R.E.A.L. Curriculum Michael. Prev Sci. 2003;4(4):233–48.

14. Kulis SS, Marsiglia FF, Porta M, Arévalo Avalos MR, Ayers SL. Testing the keepin' it REAL Substance Use Prevention Curriculum Among Early Adolescents in Guatemala City. Prev Sci. 2019 May;20(4):532–43.

15. Kulis SS, Marsiglia FF, Medina-Mora ME, Nuño-Gutiérrez BL, Corona MD, Ayers SL. Keepin' It REAL—Mantente REAL in Mexico: a Cluster Randomized

Controlled Trial of a Culturally Adapted Substance Use Prevention Curriculum for Early Adolescents. Prev Sci [Internet]. 2021;22(5):645–57. Available from: https://doi.org/10.1007/s11121-021-01217-8

16. Hecht ML, Shin Y, Pettigrew J, Miller-Day M, Krieger JL. Designed Cultural Adaptation and Delivery Quality in Rural Substance Use Prevention: an Effectiveness Trial for the Keepin' it REAL Curriculum. Prev Sci. 2018 Nov;19(8):1008–18.

17. Cutrín O, Kulis S, Maneiro L, MacFadden I, Navas MP, Alarcón D, et al. Effectiveness of the Mantente REAL Program for Preventing Alcohol Use in Spanish Adolescents. Psychosoc Interv [Internet]. 2021;30(3):113–22. Available from: doi.org/10.5093/pi2020a19

18. Marsiglia FF, Kulis S, Yabiku ST, Nieri TA, Coleman E. When to Intervene : Elementary School , Middle School or Both ? Effects of keepin ' It REAL on Substance Use Trajectories of Mexican Heritage Youth. 2011;48–62.

19. Elek E, Wagstaff DA, Hecht ML. Effects of the 5th and 7th Grade Enhanced Versions of the Keepin' it Real Substance Use Prevention Curriculum . J Drug Educ. 2010;40(1):61–79.

20. Kulis S, Nieri T, Yabiku S, Stromwall LK, Marsiglia FF. Promoting reduced and discontinued substance use among adolescent substance users: Effectiveness of a universal prevention program. Prev Sci. 2007;8(1):35–49.

21. Marsiglia FF, Booth JM, Ayers SL, Nuño-Gutierrez BL, Kulis S, Hoffman S. Short-Term Effects on Substance Use of the Keepin' It REAL Pilot Prevention Program: Linguistically Adapted for Youth in Jalisco, Mexico. Prev Sci. 2014;15(5):694–704.

22. Kulis SS, Garcia-Perez H, Marsiglia FF, Ayers SL. Testing a Culturally Adapted Youth Substance Use Prevention Program in a Mexican Border City: Mantente REAL.

Subst Use Misuse [Internet]. 2020;56(2):245–57. Available from: https://doi.org/10.1080/10826084.2020.1858103

23. Marsiglia FF, Medina-Mora ME, Gonzalvez A, Alderson G, Harthun M, Ayers S, et al. Binational Cultural Adaptation of the keepin' it REAL Substance Use Prevention Program for Adolescents in Mexico. Prev Sci. 2019;20(7):1125–35.

24. Marsiglia FF, Kulis SS, Cutrín O, Medina-Mora ME, Real T, Nuño-Gutiérrez BL, et al. The feasibility, acceptability, and utility of Mantente REAL: The culturally adapted version of keepin' it REAL for Mexico. Prev Sci [Internet]. 2022; Available from: https://doi.org/10.1007/s11121-022-01409-w

25. Pettigrew J, Graham JW, Miller-Day M, Hecht ML, Krieger JL, Shin YJ. Adherence and delivery: Implementation quality and program outcomes for the 7th grade keepin' it REAL program. Prev Sci [Internet]. 2015;16(1):90–9. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3624763/pdf/nihms412728.pdf

26. Keller-margulis MA. Fidelity of implementation framework: a critical need for response to intervention models. 2012;49(4):342–52.

27. McDavid JC, Huse I, Hawthorn LR. Program evaluation and performance measurement: An introduction to practice. Sage Publications; 2018.

28. Yeaton WH, Sechrest L. Critical Dimensions in the Choice and Maintenance of Successful Treatments : Strength , Integrity , and Effectiveness. 1981;49(2):156–67.

29. Dusenbury L, Brannigan R, Falco M, Hansen WB. A review of research on fidelity of implementation : implications for drug abuse prevention in school settings. 2003;18(2):237–56.

30. Hill HC, Erickson A. Using Implementation Fidelity to Aid in Interpreting Program Impacts: A Brief Review. Educ Res. 2019;48(9):590–8.

31. Pettigrew J, Miller-Day M, Shin YJ, Hecht ML, Krieger JL, Graham JW. Describing Teacher-Student Interactions: A Qualitative Assessment of Teacher Implementation of the 7th Grade keepin' it REAL Substance Use Intervention. Am J Community Psychol. 2013;51(1–2):43–56.

32. Stirman SW, Miller CJ, Toder K, Calloway A. Development of a framework and coding system for modifications and adaptations of evidence-based interventions. Implement Sci. 2013;8(1):1–12.

33. Harn B, Parisi D, Stoolmiller M. Balancing Fidelity With Flexibility and Fit: What DoWe Really Know About Fidelity of Implementation in Schools? 2013;79(2):181–93.

34. Sanetti LMH, Collier-Meek MA, Fallon LM. Fidelity with flexibility: Treatment acceptability and individualized adaptations of evidence-supported treatments. In: The Oxford handbook of treatment processes and outcomes in psychology: A multidisciplinary, biopsychosocial approach. Oxford University Press; 2016. p. 289–308.

35. Kulis SS, Marsiglia FF, Porta M, Arévalo Avalos MR, Ayers SL. Testing the keepin' it REAL Substance Use Prevention Curriculum Among Early Adolescents in Guatemala City. Prev Sci. 2018;20(4):532–43.

36. Creswell JW, Clark VLP. Designing and Conducting Mixed Methods Research. Thousand Oaks, CA: Sage; 2006. 520 p.

37. Miller-Day M, Hecht ML. Narrative Means to Preventative Ends: A Narrative Engagement Framework for Designing Prevention Interventions. Health Commun. 2013;28(7):657–70.

38. Hecht ML, Krieger JLR. The principle of cultural grounding in school-based substance abuse prevention: The drug resistance strategies project. J Lang Soc Psychol. 2006;25(3):301–19.

39. Botvin GJ. Substance Abuse Prevention Research: Recent Developments and Future Directions. J Sch Health. 1986;56(9):369–74.

40. Cialdini RB, Reno RR, Kallgren CA. A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. J Pers Soc Psychol. 1990;58(6):1015–26.

41. Sanchez ZM, Valente JY, Sanudo A, Pereira APD, Cruz JI, Schneider D, et al. The #Tamojunto Drug Prevention Program in Brazilian Schools: a Randomized Controlled Trial. Prev Sci. 2017;18(7):772–82.

42. Sanchez ZM, Valente JY, Galvão PP, Gubert FA, Melo MHS, Caetano SC, et al. A cluster randomized controlled trial evaluating the effectiveness of the school-based drug prevention program #Tamojunto2.0. Addiction. 2021;116(6):1580–92.

43. Faggiano F, Vigna-Taglianti F, Burkhart G, Bohrn K, Cuomo L, Gregori D, et al. The effectiveness of a school-based substance abuse prevention program: 18-Month follow-up of the EU-Dap cluster randomized controlled trial. Drug Alcohol Depend. 2010;108(1–2):56–64.

44. Carlini EL de A, Noto AR, Carlini CM de A, Locatelli DP, Abeid LR, Amato T de C, et al. VI Levantamento Nacional sobre o Consumo de Drogas Psicotrópicas entre Estudantes do Ensino Fundamental e Médio das Redes Publica e Privada de Ensino nas 27 Capitais Brasileiras. 2010.

45. IBGE - Instituto Brasileiro de Geografia e Estatística. Pesquisa Nacional de Saúde do Escolar 2015. 2016;

46. ABEP AB de E de P-. Critério de Classificação Econômica do Brasil [Criteria for Economic Classification in Brazil] [Internet]. 2012. Available from: http://www.abep.org/criterio-brasil

47. Valente JY, Cogo-Moreira H, Swardfager W, Sanchez ZM. A latent transition analysis of a cluster randomized controlled trial for drug use prevention. J Consult Clin Psychol [Internet]. 2018 Aug;86(8):657–65. Available from: http://doi.apa.org/getdoi.cfm?doi=10.1037/ccp0000329

48. Who - World Health Organization. Qualitative research for health programmes. 1994. p. 99.

49. Patton MQ. Qualitative research and evaluation methods. 3rd Editio. Thousand Oaks: Sage Publications; 2002.

50. Beroho M, Briak H, El Halimi R, Ouallali A, Boulahfa I, Mrabet R, et al. Analysis and prediction of climate forecasts in Northern Morocco: application of multilevel linear mixed effects models using R software. Heliyon [Internet]. 2020;6(10):e05094. Available from: https://doi.org/10.1016/j.heliyon.2020.e05094

51. Pinheiro JC, Bates DM. Mixed-Effects Models in S and S-PLUS. Springer; 2000.

52. Fereday J, Muir-Cochrane E. Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. Int J Qual Methods. 2006;5(1).

53. Strauss A, Corbin J. Bases de la investigación cualitativa - técnicas y procedimientos para desarrollar la teoría fundamentada. 2012.

54. Kim JS. Making Every Study Count: Learning From Replication Failure to Improve Intervention Research. Educ Res. 2019;48(9):599–607.

55. Jacob RT, Doolittle F, Kemple J, Somers MA. A Framework for Learning From Null Results. Educ Res. 2019;48(9):580–9.

56. Castro FG, Barrera M, Martinez CR. The Cultural Adaptation of Prevention Interventions: Resolving Tensions Between Fidelity and Fit. Prev Sci. 2004;5(1):41–5.

57. Parson S, Davis S, Scales R, Williams JB, Kear K. How and Why Teachers Adapt Their Literacy Instruction. English. 2010. p. 235.

58. Odom SL, Fleming K, Diamond K, Lieber J, Hanson M, Butera G, et al. Examining different forms of implementation and in early childhood curriculum research. Early Child Res Q [Internet]. 2010;25(3):314–28. Available from: http://dx.doi.org/10.1016/j.ecresq.2010.03.001

59. Creswell JW. Research Design - Qualitative, Quantitative, and Mixed Methods Approaches. 4th ed. SAGE; 2014.

60. Ringwalt CL, Vincus A, Ennett S, Johnson R, Rohrbach LA. Reasons for teachers' adaptation of substance use prevention curricula in schools with non-white student populations. Prev Sci. 2004;5(1):61–7.

61. Miller-Day M, Pettigrew J, Hecht ML, Shin YJ, Graham J, Krieger J. How prevention curricula are taught under real-world conditions: Types of and reasons for teacher curriculum adaptations. Health Educ. 2013;113(4):324–44.

62. Center BNI. TIC EDUCAÇÃO - Pesquisa Sobre o Uso das Tecnologias de Informação e Comunicação nas Escolas Brasileiras 2018 [Internet]. Pesquisa sobre o uso das tecnologias de informação e comunicação na escolas brasileiras : TIC educação 2018. Núcleo de Informação e Coordenação do Ponto BR e Comitê Gestor da Internet no Brasil. 2019. Available from: https://cetic.br/media/docs/publicacoes/216410120191105/tic_edu_2018_livro_eletronico.pdf

63. Warren JR, Hecht ML, Wagstaff DA, Elek E, Ndiaye K, Dustman P, et al. Communicating Prevention: The Effects of the keepin' it REAL Classroom Videotapes and Televised PSAs on Middle-School Students' Substance Use. J Appl Commun Res. 2006 May;34(2):209–27.

64. Medeiros PFP, Cruz JI, Schneider D, Sanudo A, Sanchez ZM. Process evaluation of the implementation of the Unplugged Program for drug use prevention in Brazilian schools. Subst Abus Treat Prev Policy [Internet]. 2016;11(1):1–11. Available from: http://dx.doi.org/10.1186/s13011-015-0047-9

65. Daniel JZ, Hickman M, Macleod J, Wiles N, Lingford-Hughes A, Farrell M, et al. Is socioeconomic status in early life associated with drug use? A systematic review of the evidence. Drug Alcohol Rev. 2009;28(2):142–53.

Table 1: Distribution of 5th and 7th graders according to sociodemographic data, drug use (alcohol, binge drinking, tobacco and marijuana) and allocation group in the cluster randomized controlled trial of the PROERD program, according to baseline. Brazil, 2019 (N=4,030; 1,727 5th and 2,303 7th graders).

	Total		Intervention		Control	
	N	%	N	%	N	%
5th grade students	**(N=1,727)**		**(N=801)**		**(N=926)**	
Gender						
Male	882	51.07	432	53.93	450	48.60
Female	845	48.93	369	46.07	476	51.40
Age (mean±SD)	10.12±0.65		10.10±0.68		10.14±0.61	
SES[a]						
A	117	9.00	49	7.94	68	9.96
B	447	34.38	224	36.30	223	32.65
C	646	49.69	309	50.08	337	49.34
D-E	90	6.92	35	5.67	55	8.05
Alcohol						
Past year Use	161	9.36	81	10.18	80	8.65
Binge drinking						
Past year Use	20	1.16	9	1.13	11	1.19
Tobacco						
Past year Use	12	0.70	6	0.75	6	0.65
Marijuana						
Past year Use	4	0.23	1	0.13	3	0.33
7th grade students	**(N=2,303)**		**(N=1,200)**		**(N=1,103)**	
Gender						
Male	1,187	51.54	621	51.75	566	51.31
Female	1,116	48.46	579	48.25	537	48.69
Age (mean±SD)	12.28±0.72		12.28±0.74		12.27±0.71	
SES[a]						
A	130	5.71	74	6.25	56	5.12
B	773	33.93	416	35.14	357	32.63
C	1,222	53.64	629	53.13	593	54.20
D-E	153	6.72	65	5.49	88	8.04
Alcohol						
Past year Use	442	19.26	234	19.57	208	18.93
Binge drinking						
Past year Use	132	5.77	71	5.95	61	5.58
Tobacco						
Past year Use	36	1.57	20	1.67	16	1.46
Marijuana						
Past year Use	41	1.79	22	1.84	19	1.73
Inhalants						
Past year Use	57	2.49	31	2.60	26	2.37
Cocaine						
Past year Use	2	0.09	0	-	2	0.18

[a] SES: Socioeconomic status according to ABEP Scale – A (45 to 100 points), B (29 to 44 points), C (17 to 28 points) and D/E (0-16 points), where A is the highest and E the lowest

Table 2: Descriptive fidelity and drug use[c] in the follow-up assessment.

	Control		Intervention			
			Low fidelity[a]		High fidelity[b]	
	N	%	N	%	N	%
5th grade students	**(N=926)**		**(N=513)**		**(N=288)**	
Alcohol	55	7.88	35	8.60	12	5.33
Binge drinking	4	0.57	0	0	2	0.88
Tobacco	8	1.15	2	0.49	0	0
Marijuana	1	0.14	1	0.25	0	0
7th grade students	**(N=1.103)**		**(N=498)**		**(N=702)**	
Alcohol	216	25.96	96	24.74	150	29.24
Binge drinking	58	6.98	26	6.70	56	10.92
Tobacco	22	2.64	13	3.35	15	2.91
Marijuana	17	2.04	8	2.06	10	1.94
Inhalants	29	3.49	8	2.07	20	3.90
Cocaine	3	0.36	1	0.26	0	0

[a] High fidelity describes those who attended at least 80% of the activities proposed by PROERD curricula
[b] Low fidelity describes those who attended less than 80% of the activities proposed by PROERD curricula
[c] Drugs used in the 6 months prior to follow-up assessment

Table 3: Results on the **completeness** and **alterations** made to the PROERD program based on PROERD fidelity forms

5th grade (N=35 classrooms)	**Completeness**		**Alterations**		7th grade (N=47 classrooms)	**Completeness**		**Alterations**	
	N	**%**	**N**	**%**		**N**	**%**	**N**	**%**
Lesson 1 (N=34)	30	88.23	5	7.35	Lesson 1 (N=43)	42	97.67	2	2.33
Lesson 2 (N=29)	13	44.83	7	8.05	Lesson 2 (N=43)	41	95.35	5	11.63
Lesson 3 (N=28)	27	96.43	5	17.86	Lesson 3 (N=37)	5	86.49	2	2.70
Lesson 4 (N=34)	34	100	6	8.82	Lesson 4 (N=37)	37	100	8	21.62
Lesson 5 (N=27)	24	88.89	6	7.41	Lesson 5 (N=36)	36	100	3	8.33
Lesson 6 (N=30)	23	76.67	14	15.55	Lesson 6 (N=36)	34	94.44	4	11.11
Lesson 7 (N=30)	6	20	4	6.67	Lesson 7 (N=38)	34	89.47	1	2.63
Lesson 8 (N=28)	22	78.57	8	4.28	Lesson 8 (N=37)	32	86.49	5	6.76
Lesson 9 (N=30)	26	86.67	2	3.33	Lesson 9 (N=40)	34	85	7	8.75
Lesson 10 (N=33)	29	87.88	2	3.03	Lesson 10 (N=40)	27	67.50	10	8.33

Completeness: N= times when lesson activities were delivered. % = activities completed in each class.
Alteration: N= times when lesson activities were altered. % = activities altered in each class.

Table 4: Effect of PROERD fidelity over the past 6-month drug use among 5th graders* (N=1,727).

	Implementation fidelity					
	Low fidelity			**High fidelity**		
	OR	**95%CI**	**p-value**	**OR**	**95%CI**	**p-value**
Alcohol	1.05	[0.651;1.704]	0.830	0.70	[0.359; 1.365]	0.295
Binge drinking	1	-	-	1.82	[0.309; 10.687]	0.509
Tobacco	0.46	[0.096; 2.181]	0.327	1	-	-
Marijuana	2.19	[0.120; 40.046]	0.596	1	-	-

*All analyses were adjusted by sex, age and SES.

Table 5: Effect of PROERD fidelity over the past 6-month drug use among 7th graders* (N=2.303).

	Implementation fidelity					
	Low fidelity			**High fidelity**		
	OR	**95%CI**	**p-value**	**OR**	**95%CI**	**p-value**
Alcohol	0.77	[0.470; 1.253]	0.292	1.05	[0.674; 1.623]	0.841
Binge drinking	0.77	[0.357; 1.658]	0.504	1.28	[0.683; 2.404]	0.441
Tobacco	1.19	[0.447; 3.161]	0.729	1.52	[0.693; 3.353]	0.294
Marijuana	NE	-	-	NE	-	-
Inhalants	1.59	[0.601; 4.204]	0.350	0.72	[0.273; 1.904]	0.510
Cocaine	NE	-	-	NE	-	-

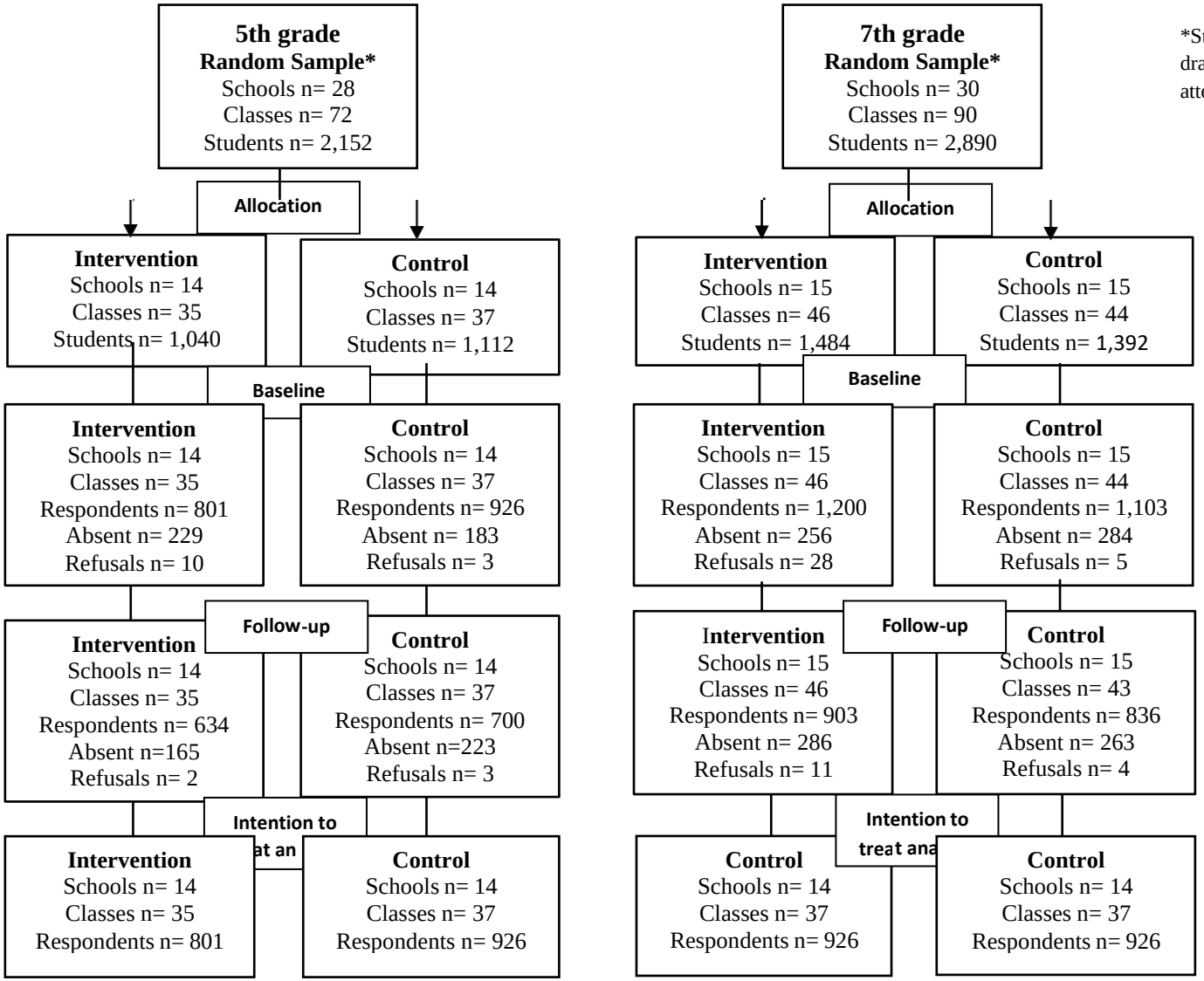
N.e. not estimate

*All analyses were adjusted by sex, age and SES.

Table 6: Main results from the qualitative analysis regarding the PROERD instructors participating in the study (N=19).

Dimension	Subtopic	Description	Golden quotes
Adaptation	Adaptation according to the student literacy	Changes made by the instructors because students would not understand the purpose of the activity or lacked proper writing-reading skills.	*"The instructor has to be aware of such difficulties and adapt the activity so that group can understand. For example, they* [the students] *have to write an essay, but one student does not know how to write. That student is at a disadvantaged, right? How will they compete—I have a medal* [to give them]*—if they do not know how to write? How will they receive the medal? So, we have to evaluate them differently, as they also have the right to receive* [the medal]*, to show what they learned. You can ask them "what have you learned?", record the answer, and they will narrate, explain, and speak, and you will evaluate them along with the others* [answers]*. Hence, there has to be a different form of assessment, and you have to be ready for it." (P10)*
	Addition of content and/or activities	Addition of content and/or activities that go beyond the suggested topic in the material.	*"We start the subject. When I get to the topic of cigarettes, I also discuss marijuana, along with cocaine and other drugs, because none have been mentioned* [in the curricula]*!" (P18)*
	Changes in the curricula	Changes made to the PROERD curricula according to the instructors' opinions of what works or not, excluding all other reasons.	*"There are situations in the PROERD classes, during the activity, that I make changes! Changes that I think need to be done! Because if I do make changes, I believe it will not work." (P4)*
	Exclusion of content and/or activities	Exclusion of content and/or activities because the instructor lacks the required resources.	*"I take this opportunity to mention that the issue with video demonstration is that many schools lack the material conditions to show videos, you see? Some schools lack projectors. Some schools have an unusable television in the classroom and lack a sound system, so this is a considerable difficulty." (P10)*
Accumulation of functions	Rarely assigned other activities	Instructors supported by superiors and are rarely assigned other police activities, thus not impacting program application.	*"Our police battalion supports us. Fortunately, they assign us to other operations rather sporadically, you know? Thus, it does not influence our work considerably. We can develop the PROERD program smoothly, as individuals working with PROERD are rarely assigned other activities! For us here, it is super smooth. However, we know other places where police instructors work around the school, have to apply PROERD, and perform police operations… it doesn't work very well. Here, for us, it is super peaceful." (P7)*
	Assigned other activities because they take part in PROERD	Instructors who believe they are assigned more police duties because they take part in PROERD.	*"Police routine harms PROERD because the staff, the administration, and our hierarchical superiors often assume that PROERD officers, because we work during administrative hours teaching at schools, do nothing. Hence, they think our work* [with PROERD] *is very easy. They end up committing us to extra shifts—"oh, you don't do anything anyway, so, have an extra shift"—assigning us on weekends, at different times, because they think we don't do anything during our normal working hours, you know? And this ends up hampering* [the work with PROERD]*." (P8)*
	Assigned other activities during class hours	Instructors assigned police duties during class hours.	*"Even during class hours, they* [the superiors] *do not care. That's the problem. They usually put us on the school round, and the school round is at the same time as our* [classes]*, only we… they follow their schedule, we don't." (P1)*
School infrastructure	School reality	Instructors face difficulties to implement the program at public schools that lack material and media resources.	*"But the difficulty we face concerns media resources; if you need some paper, that is a resource… Yeah, supply material. There are no conditions, the school has no material conditions." (P2)* *"What stands out is the school structure, the lack of resources and space to show* [the multimedia part of the program]*, apply it, especially for seventh graders, because it* [the seventh grade curricula] *needs video, a specific room, and so many public schools lack that. It is a matter of the material and the infrastructure of the State itself." (P2)*

Figure 1: Flowchart of the randomized controlled trial assessing the effect of the PROERD drug use prevention program among 5th and 7th graders.



*Students enrolled in schools drawn in 2019 – not necessarily attending school.

6.2 Artigo 2

Why and how Brazilian DARE-kiR instructors adapt the program during delivery: an implementation research approach

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Abstract

Background The Drug and Violence Resistance Educational Program (PROERD) is the most widely implemented prevention program in Brazil and this study investigated the reasons and the ways Proerd instructors change the program and affected fidelity of implementation. **Methods** This qualitative method study used three data sources: semi-structured interviews were conducted with 19 PROERD police officers instructors, fidelity forms filled by the instructors, and the researcher observations of 30 lessons, followed by thematic analysis. **Results** There is strong evidence that the instructors adapt the program, in general, because they have the impression that some activities do not work when implemented as they were created by the developers. The main reasons for adapting the program were categorized in two groups: intrinsic and extrinsic reasons. Theextrinsic reasons were students' cultural reality and scholar performance, and school's support and infrastructure, and the intrinsic reason was the instructors' performance. **Conclusion** In order to to make PROERD feasible according to the students and the schools, instructors change the program in a non structured way, not following the curricula many times, thus, PROERD will hardly have a positive effect for Brazilian students.

Keywords Implementation fidelity, Prevention, Mixed-methods, Adolescent, School, Drugs

Introduction

Considering the growing burden of drug use among adolescents (142), evidence-based prevention programs have been implemented worldwide (50). Keepin' it REAL *(*kiR*)* is an example of a school-based prevention program founded on scientific evidence developed to promote the development of life skills, resistance skills (refuse, explain, avoid, and leave), and decision-making (143,144**).** Over the last two decades, kiR developers have culturally adapted and produced different program versions, according to the country (e.g. Mexico (145), Guatemala (146), Spain (147), area of the city (e.g. urban and rural area) (148) or cultural (e.g. Mexican/Mexican American, Multicultural, Black/White) (144,149,150) where it was replicated.

In 2009, the Los Angeles Police Department (United States), through Drug Abuse Resistance Education (D.A.R.E.) adopted the kiR prevention program and adapted it to be implemented by police officers in American schools, renaming the program as The Drug Abuse Resistance Education Keepin'it REAL (D.A.R.E.-kiR). The Brazilian Military Police of all States, through the Drug Resistance Educational Program (PROERD), in partnership with the American D.A.R.E., translated the D.A.R.E.-kiR program, and since 2014 has been implementing this curriculum in Brazilian schools, renamed as "*Caindo na Real."* This curriculum has two different versions (5^{th} and 7^{th} grade) and has been delivered by trained police officers in public and private schools.

PROERD is currently the most prevalent drug and violence prevention program in Brazilian schools (151). In the first evaluation of the PROERD' effectiveness, it was found that the program did not achieve the expected preventive results that could justify its application as a public policy (152). In the case of a negative result found in the evaluation of a program that has been largely delivered as a public policy, it is important

to conduct other studies to understand the potential reasons underlying the program's failure.

Considering the positive results, the program that originated PROERD (kiR program) achieved in other contexts in the 7thgrade curriculum (153), one possible explanation for the null findings of the Brazilian version can be related to the implementation of the program. In addition, a previously study already raised important aspects related to Proerd's fidelity of implementation, that is, what was planned to be offered actually occurred and the level of completeness of this offer (68). That study showed that instructors are making adaptations in the program's curriculum according to the reality they face in the different schools (154).

It is known that fidelity can impact programs' outcomes, in a way that the higher the fidelity, the best the outcomes (155). However, it has been discussed lately that some degree of flexibility must be considered for the program to be feasible in real-life scenarios (156). Thus, it is of great importance to consider the different environments in which the program would be delivered (157) for a better comprehension whether it could be a good fit for that target population and for PROERD to be in accordance with the positive kiR results. Accordingly, Miller-day and colleagues (158) addressed that program developers need a better understanding of the types of adaptations and reasons implementers provide for adapting curricula for programs to be effectively implemented.

Based on that, this study aims to investigate how and why PROERD's instructor adapt the curriculum during implementation , in order to support future decisions about its sustainability and dissemination in Brazil.

Methods

It is a qualitative study based on data collected from interviews with police officers instructors, fidelity forms, and the researcher observations performed during a randomized controlled trial (152) that evaluated the PROERD effectiveness.

Intervention

The school-based PROERD "Caindo na Real" program consists of ten 50-minute weekly classes taught by trained police officers within the classroom environment according to a student's and teacher's manuals. The teacher's manual is used by the police officer responsible for teaching the class. It provides information about the procedures, objectives, required materials, activities, and tips to each lesson, including one to three activities. All officers participating in the program underwent an 80-hour training offered by the Military Police, under the guidance of DARE America.

All curriculums were developed based on the theories of Narrative Engagement (159), the Principle of Cultural Grounding (160), Social and Emotional Learning (161), and Normative beliefs to use drugs (97). In Brazil, the program is implemented by the Military Police of the state of São Paulo. We found no information regarding the program cultural adaptation process, but the comparison of DARE-kiR and PROERD manuals suggests that the material used in Brazil is a mere translation of the DARE material. This indicates that PROERD lacks cultural values and socio-environmental factors proper to the Brazilian context.

Data Collection

Data were collected using three sources: interviews with the instructors, fidelity forms filled by the instructors and observations forms.

The first data collection occurred through semi-structured interviews; that is, most questions were previously defined, but the interviewer was free to add others if needed

(138). All interviewees were asked the same set of basic questions aiming to reduce the interviewer' interference and facilitate data organization, comparison, and analysis (162).

The interviews lasted 45 minutes on average and expatiated on the following topics: (i) how and why the participants became a PROERD instructor; (ii) what were the effects of the program and how they perceived it; (iii) how was their relationship with the school couselour was and how could it affect the program effects; (iv) if they considered the program training to be enough and how it influenced their work with PROERD; (vi) their opinions about the material and its content; (vii) what programmed activities were well and poorly accepted by the students; (viii) differences in the application of the curricula for fifth and seventh grades; (ix) how PROERD demands affected other policeman duties and vice versa; (x) what they would change in the program; and (xi) what could be done to improve PROERD implementation. All interviews were recorded with prior consent of the interviewees, and the resulting data was anonymized, transcribed in verbatim, and identified by an alphanumeric code generated from the letter (P), meaning police officer, and a random number assigned according to the order of the interviews (01, 02, 03…) and unrelated with the schools.

The second data set came from online self-administered questionnaires completed by instructors after the implementation of each lesson, reporting whether the programmed activities were delivered (yes/no questions) and if each activity was adapted/altered by instructors (yes/no questions plus open-ended questions). Based on the instructor's manual, the forms provided a list of all expected activities that should be delivered in each lesson. The first author (JDG) trained police officers to fill each item in the form. These forms provided data on the dosing of the intervention (activities actually delivered), incompleteness of activities (activities expected to be delivered but that were excluded), percentage rates of activities that were changed in each lesson, and examples of alteration.

For this study, we considered only the open-ended questions from the forms, in which the instructors would explain what happened for the activity to be changed/not completed.

The first author (J.D.G.) carried out the third data collection through the class observation guided by a structured form. In these forms, it was possible to register the number of students present, the application of the lessons (based on the guidelines of the instructors' training), if there was any change in the original protocol, and how was the interaction between those involved (instructors with students and students among themselves).

Data analysis

Thematic analysis was conducted (140) using axial coding, in which a priori analytical categories were generated based on topics of interview guides, subsequently linked to other subcategories, following the lines of its properties and dimensions (141). This analysis indicates the presence of 9 codes organized into intrinsic and extrinsic reasons for changing the programs. The extrinsic reasons were those that were not in the instructors' control, and the intrinsic reasons concerned the instructors themselves. Intrinsic reasons derived in to the "instructors' performance" theme, and had three codes (concerns about time, instructors' opinions, and not using PROERD's material). Extrinsic reasons derived the themes of "students' reality" (with the codes: literacy, disabilities, inappropriate behavior, and social and cultural realities) and "school scene" (with the codes: reality of public schools and school's administration). (**Figure 1**). Qualitative analysis was performed using ATLAS.ti © software version 7.5.4.

Coding was initially performed by the first author (J.D.G.), a Ph.D. candidate in public health with training and experience in qualitative analysis. Once information underwent its first version of coding, it was subjected to interpretive triangulation, in which the second author (R.G.), an anthropologist and Ph.D. candidate, analyzed the data

in parallel and submitted to the senior author (ZMS) interpretation. Disagreements were resolved by discussions and through a second review of interview transcripts. Finally, findings reported and discussed in this manuscript resulted from a consensus among researchers.

Results

Table 1 shows the summarizes of the interviewees' characteristics and the type of alteration each of them made. **Annex S1** (Supplementary File) presents the semi-structured interview script applied to police officers.

According to the triangulation of the data sources - speeches from the interviews, the fidelity forms, and the researcher observations -, there is strong evidence that the instructors adapt the program, in general, because they have the impression that some activities do not work when implemented as they were created by the developers.

> *"There are situations at the Proerd lesson, the activity, that I change! And that I think that need to be changed! Because if I don't change, I realize that it won't work."* (P04)

When this subject emerged during the interviews and was deepened, it was identified "extrinsic and intrinsic reasons to the instructors" for the adaptations to occur for both 5th and 7th grades curricula, classified in three dimensions - instructor's performance, student's reality, and school environment, corresponding to 9 codes. **Table 2** summarizes the respective golden quotes.

Extrinsic reasons

There are situations concerning the delivery of Proerd that are not in the instructor's control, and in this study were coded as extrinsic reasons for changing the program. The main extrinsic reasons were students' reality and school environment.

Special educational needs of students

The instructors' main issue about the delivery of the program is concerning the students. It can be related to students' literacy, students' disabilities, social and cultural context, and behaviors in class. All these subjects were also seen during the researcher's observations.

The students' level of literacy seems to be the biggest reason for changing the Proerd curricula according to the interviews and fidelity forms, since most of the instructors described that many students have difficulties in reading and writing properly. Proerd activities depend on reading, interpreting, and answering activities through writing, what poses a challenge to the instructors who must adapt activities to allow all the students to participate. Adding to that, instructors also feel that some students do not understand simple words used in the stories and in the program content, so they end up adapting the whole story or activity. During the observations, the researcher noticed that some instructors had to write the answers from the activities on the board so the students could copy, which took longer than expected for the lesson.

> *"Are there any difficulties? There are, right? Because unfortunately, some students can't read, they can't write, but you can develop the program with them. There are other classes that you don't have whatsoever. You cannot develop the lesson. So, of course, you will adapt according to reality."* (P07)

Attempt to capture the attention of students living in drug-trafficking contexts

Generally, Brazilian public schools serve students mainly from lower-income families. Adding to that, the schools participating in this study were from vulnerable areas, which has a big influence of the drug traffic. Thus, the students are used to being around drug use scenes, making it harder for the instructor to stick to the manual, since they feel some of the students might think that the subjects addressed do not fit the reality

that they have lived in their homes. The researcher witnessed moments when the students from both grades laughed at the activity.

> *"So, it is difficult for you to talk to a student, the son of a drug dealer* [for example], *who saw during his childhood people packing drugs, it is much more difficult for you to use the curriculum, the right segment to speak, and you have to address the reality: "oh, my experience on the street at 911 was like that, the occurrence went that way, I conducted that way", it has more effect than taking the curriculum segment."* (P11).

Changes made to culturally adapt the program material

Moreover, the cultural aspect of the material doesn't match the students' cultural characteristics. Proerd curricula are the translations of a North American prevention program, so all of the situations brought by the program, either videos or stories, are related to American adolescents. Especially in Brazilian public schools, the reality is very different from what is shown by the Proerd material (in detail on the next topic). Also, in one of the researcher's observations the instructor used the subtitled video, which enhances the difficulties of the students to understand the lesson if they are not used to reading fast.

> *"The video does not match the reality. When you tell a story, you stop, play a video, the child watches that video, you clearly see their disappointed face when they start to watch (...) so I would replace it with something or more real, or more Brazilian, or I would change the stories, I would tell cooler, funnier stories, I would say other things, you know? I don't think it suits our students; I think they don't even look* [at the videos]. *To tell you the truth, I think there are few* [police officers] *who use it* [the videos]. *They prefer to tell stories of their life,*

or to tell real stories, things that happen in everyday life, so you can get more attention from students." (P14)

Problems in providing instruction to neurodiverse students

The instructors also pointed to the fact that they are not trained to implement the program for kids with a disability, such as autism or other psychiatric condition, and the material doesn't have options for adapting the program in that scenario. Thus, either they don't include the "special [needs]" student and apply the lesson according to the manual, as seen in the observations, or they adapt it.

"What they teach [in the training] *is basically for literate students, and when you have a student who is not literate, how do you deal with them? A student with a mental, physical disability… anyways, you get all kinds of children, and you have to know how to deal with them all in the same way. And then the instructor has to get by their own!"* (P02).

Lack of order in the classroom environment

Finally, when considering students' behavior, the instructors face difficulties as well, since this aspect should be mitigated by the presence of the teacher during the class, which does not always happen. During the class observations, the researcher witnessed that, even when the teacher is present, they use the time to do other shores, and do not help the instructor. Thus, instructors must deal with inappropriate behaviors the way they think it is better: giving attention only to those who are participating and not interrupting the class, or stopping the lesson to discipline the students, which leads to unfinished the activities.

"You stop all the time to get attention, and you lose class time. You get behind [with the lessons]*!* [You] *Cannot complete the entire lesson."* (P02).

Lack of support from school authorities

Instructors say that the way the school's principal feels about the military police influence the availability of the program's application. When the school's administrations are against the presence of the police there, either they don't allow the delivery of the program or, when they do allow it, they make it difficult for the instructors to work:

> *"Well, the administration influences a lot, because there are schools that we contact in which the administration itself does not like the military police, so they will try to make it as difficult as possible for our contact with students and the availability of vacant space to teach."* (P01).

Lack of resources in schools to deliver the program's classes to students

However, since Proerd is the most disseminated program in Brazil, there are many schools which support the presence of the police instructors in the school's routine. When it happens, the issues the instructors face are related to the reality of public schools in the country but not barriers imposed by the school principal.

> *"Ah, most principals and coordinators support the project, but the school sometimes doesn't have many resources. Like here* [in this school]*, we don't have a blackboard, they* [the students] *don't write properly, because they don't have a desk… and if I go to the classroom, I don't have the projector. Then we must choose* [what to do]. *They* [the school's administration] *do what they can. And so do we."* (P12).

This was also seen during the researcher's observations. Most of the schools (11 out of 15) didn't have the resources to display audiovisual materials, and, when they did, the room was not appropriate for the students to also answer the activities in the student's manual. Most of students answered the questions holding the book on their laps.

When the necessary resources did not exist in the schools to carry out the activities as foreseen in the program's curriculum, some instructors changed the lessons and the

activities in several ways: by not applying some activity from the lesson, by adding some content in the class, and by not showing the audiovisual material, which appeared to be the most prevalent adaptation.

> *"We must present the slides on the projector. There are schools that don't have the projector (...) and then you must change the whole dynamic. You must pick up all the students and take them to a room that will, rarely, have the projector, because other teachers are always using the room that has it, and then you never get to show the audiovisual material. I never showed that."* (P17).

Instructors use their own resources to deliver the program

Nevertheless, there are some other instructors whose find the way to deal with the lack of resources at school in a sense that the lessons are taught as they are supposed to. They take their own laptops, projectors, and buy the material needed for the classes, but that is not expected of them to do. These resources should be provided by the school or the Military Police.

> *"I bring the material, I buy it using my own money, anyways, I write it* [the video content] *on the blackboard. When there are resources, which most* [of schools] *don't have (...) I print the images, anyway..."* (P02).

> *"Of course, even at the school where we are here, we see the deficiencies, don't we? Weaknesses because it's a state school, there's no computer, no projector, and I brought my computer today - that computer is mine -, so we do our best to bring the resources to the students."* (P13).

Intrinsic reasons

Some important aspects of the implementation of Proerd were only noticed by the researcher's observations but not mentioned by the police officers in the interviews, and they must be cited to allow improvements. These aspects concern instructors' teaching

skills and the ways they deal with the challenges, sometimes changing the lesson too much.

Lack of pedagogical skills to deliver the program

The researcher noticed that the instructors, sometimes, are not comfortable opening a discussion about the lesson topic, perhaps because they feared that there was not enough time to finish the lesson or simply because the group was not being participative. In that case, the instructor gave the right answers to the activities, but he also spoke about his opinion on the subject, which was contrary to the information in the material. On the other hand, when the researcher observed a good flow in the lesson implementation, where there was space for the students to talk about their perceptions, the instructor was not worried about finishing the lesson on that day or overpassing the class time and took longer than expected.

Lack of adherence to program delivery guidelines

In general, besides the issue about students' behavior, addressed earlier, there was not enough time to finish the lesson because the instructor would spend most part of the class making a speech about his/her opinions regarding the lessons' theme, instead of focusing on the activities and letting the students do the thinking process. That way, the implementation was not following any of the guidelines from the instructor book.

Lack of adherence to the delivery of program materials

It was also possible to notice that the instructors didn't stick to the material. Some would show a different video of something they thought could be related to the lesson's topic -e.g., a video showing children encountering their parents who had returned from the war-, ask some sensitive questions that was not expected in the activity and others would not apply the activity at all -e.g., the instructor asking the students about deaths of family members- or adding information about drugs that are not included in the curricula.

Discussion

This study aimed to identify the reasons for adaptations in Proerd's curricula, made by the instructors, and how these changes occur, for both 5th and 7th grades. Analyzing the speeches from the interviews, the fidelity forms filled by the instructors, and the researcher's class observations, the main reasons for adapting the program were gathered in two groups: intrinsic and extrinsic reasons. The extrinsic reasons were compound of students' reality and school environment, and the intrinsic reason was the instructors' performance.

Brazil is a continental country, and its social inequality is highly related to poorer education (163) for those in social vulnerability. Thus, public schools tend to show some of the consequences of these disparities (164), compromising initiatives such as PROERD. Corroborating the findings from this study, the Organization for Economic Cooperation and Development (163) has shown that Brazilian students present reading performance below average, justifying the instructor's need to change the activities that are based on reading and writing for both grades.

Additionally, there has been established an inclusion policy for "special needs" students in Brazilian schools (decree 6.571/2008). However, having students with disabilities in the classroom is challenging for private and public-school teachers (165). Equally, the PROERD instructors also reported difficulties to dealing with students with disabilities, since they are not taught that during the 40-hour training and, besides that, the policemen who become instructors do not necessarily have a degree in education, making them rely only on the training to learn everything about teaching skills.

Another challenge instructors addressed during the interviews and that was confirmed by the class observations is the misbehavior among students. Accordingly, it

is known that students' lack of interest and indiscipline are important factors that make it difficult for teachers to apply a lesson as planned (166). Adding to that, when considering the schools environment, the lack of infrastructure and support from the schools' administration makes it impossible to apply the program as it is intended by the developers.

Recently, studies have shown that PROERD's curricula are not culturally adapted for Brazilian reality (152,154) and this might be the main reason for the extrinsic factors previously addressed that make the instructors change the program (167). Considering Valente and colleagues' (153) systematic review about the effects of kiR, the program which PROERD is based on, it was evidenced that kiR is effective when the material is culturally adapted to the reality of the students receiving it. PROERD seems to be a translation of DARE-kiR, and the disparity between what is presented by the materials and the students' reality has been pointed out by the instructors and by the researcher during the class observations. Additionally, previous research about kiR's fidelity of implementation has also shown that teachers applying kiR change it to be more relevant for the reality of the students, corroborating with our findings and reinforcing the need to culturally adapting prevention programs (158).

Regarding the intrinsic reasons for changing PROERD, the instructors' performance was compromised by their inability to manage class time, their lack of teaching skills and their difficulties with the program's content. It suggests that the training to become an instructor might not be enough for the policemen to develop the skills and the knowledge needed to teach. Miller-day and colleagues (158) discussed in their kiR fidelity study that follow-up training and/or technical support aimed at delivery and content issues may reduce the frequency of problems related to adaptations, increasing fidelity and, consequently, program outcomes (168–170).

These factors were only explicit during the class observations, which corroborates with previous studies evidencing that observers register more adaptations that it is described by those implementing the program (158).

Concerns about class time is the most common reason for changing the curricula when the program is implemented in real world (158). Adding to that, it seems important for those teaching to motivate students (158,166), which, for instructors who lackteaching skills, might lead to changing the activities to ones they consider more appealing to students, like different videos and talking more about drugs. More than that, teachers also tend to extend some components they prefer and omit those that they think are not essential (158). Thus, it is essential to comprehend and define the core elements of PROERD, allowing some flexibility for the instructors while ensuring an effective implementation (171).

Considering the presented results, additionally to the fact that kiR is a cultural gounded prevention program (144), we believe that PROERD must undergo a cultural adaptation, that is, making the program aligned with Brazilian cultural values and social/environmental factors (121). Recently, the prevention program implemented by Brazilian Ministry of Health, #Tamojunto2.0, underwent effectiveness evaluation, followed by adaptations according to the findings and, after that, it was found that it is effective for Brazilian students (152). Thus, we suggest that PROERD follows #Tamojunto2.0's path, contributing to the evidence-based scenario of implementing prevention programs.

Limitations

A first limitation to consider is that the schools selected to participate in the RCTs were in the low income regions of São Paulo, which experience high exposure to drug use (172); hence, instructors working in different areas could have distinct experiences and

perceptions regarding the program. Another limitation concerns the fidelity forms, which were subject to information bias due to self-reporting (173).

Conclusion

This study is the first to analyze the reasons for changing PROERD in real world scenario, using three different data sources. Future PROERD investigations must define core element of the lessons (158), since PROERD instructors with a clear understanding of the essential elements could adapt less important parts in a structured manner according to the audience. Given the country's territorial extent and its different realities, PROERD curricula must undergo a process of cultural adaptation. Moreover, the Military Police should incorporate the scientific findings regarding PROERD implementation in São Paulo and continue to investigate its effects not only in the city, but throughout the country.

References

1. Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, et al. Global burden of disease attributable to mental and substance use disorders : fi ndings from the Global Burden of Disease Study 2010. The Lancet. 2013;6736(13):1–12.
2. Malta DC, Mascarenhas MDM, Porto DL, Duarte EA, Sardinha LM, Barreto SM, et al. Prevalence of alcohol and drug consumption among adolescents : data analysis of the National Survey of School Health. Revista Brasileira de Epidemiologia. 2011;14(3).
3. Lopes GM, Arau B. Use of psychoactive substances by adolescents : current panorama. Revista Brasileira de Psiquiatria. 2013;35:51–61.
4. Chatterjee K, Dwivedi AK, Singh R. Age at first drink and severity of alcohol dependence. Med J Armed Forces India. 2021 Jan 1;77(1):70–4.
5. Hingson RW, Heeren T, Winter MR. Age at drinking onset and alcohol dependence: Age at onset, duration, and severity. Arch Pediatr Adolesc Med. 2006;160(7):739–46.

6. Sellers CM, McRoy RG, O'Brien KHMM. Substance use and suicidal ideation among child welfare involved adolescents: A longitudinal examination. Addictive Behaviors. 2019 Jun 1;93:39–45.

7. Sanchez ZM, Ribeiro KJ, Wagner GA. Binge drinking associations with patrons' risk behaviors and alcohol effects after leaving a nightclub: Sex differences in the "Balada com Ciência" portal survey study in Brazil. PLoS One. 2015 Aug 19;10(8).

8. Reis LF, Surkan PJ, Valente JY, Bertolla MHSM, Sanchez ZM. Factors associated with early sexual initiation and unsafe sex in adolescents: Substance use and parenting style. J Adolesc. 2020 Feb 1;79:128–35.

9. Pechansky F, Szobot CM, Scivoletto S. Alcohol use among adolescents: concepts, epidemiological characteristics and etiopatogenic factors. Revista Brasileira de Psiquiatria. 2004;26(I):14–7.

10. IBGE. Pesquisa Nacional de Saúde do Escolar. 2022.

11. Sloboda Z, Bukoski WJ. Handbook of Drug Abuse Prevention: Theory, Science and Practice. New York: Springer, 2006; 2006. 692 p.

12. Stockings E, Hall WD, Lynskey M, Morley KI, Reavley N, Strang J, et al. Prevention, early intervention, harm reduction, and treatment of substance use in young people. Lancet Psychiatry. 2016;3(3):280–96.

13. Sanchez ZM, Locatelli DP, Noto AR, Martins SS. Binge drinking among Brazilian students: A gradient of association with socioeconomic status in five geo-economic regions. Drug Alcohol Depend. 2013;127(1–3):87–93.

14. Jones SA, Nagel BJ, Lueras JM. Effects of Binge Drinking on the Developing Brain. Alcohol Res. 2018;39(1):87–96.

15. Kuntsche S, Kuntsche E. Parent-based interventions for preventing or reducing adolescent substance use - A systematic literature review. Vol. 45, Clinical Psychology Review. Elsevier Inc.; 2016. p. 89–101.

16. Conegundes L, Valente JY, Cogo-Moreira H, Martins CB, Andreoni S, Sanchez ZM. Transition from nonuse to use of alcohol or binge drinking among adolescents: Secondary analysis of a randomized controlled trial. Addictive Behaviors. 2020 Mar 1;102.

17. Chung T, Creswell KG, Bachrach R, Clark DB, Martin CS. Adolescent Binge Drinking Developmental Context and Opportunities for Prevention. Alcohol Res. 2018;39(1):5–15.

18. Lees B, Meredith LR, Kirkland AE, Bryant BE, Squeglia LM. Effect of alcohol use on the adolescent brain and behavior. Vol. 192, Pharmacology Biochemistry and Behavior. Elsevier Inc.; 2020.

19. Pérez-García JM, Suárez-Suárez S, Doallo S, Cadaveira F. Effects of binge drinking during adolescence and emerging adulthood on the brain: A systematic

review of neuroimaging studies. Vol. 137, Neuroscience and Biobehavioral Reviews. Elsevier Ltd; 2022.

20. Danielson CK, De Arellano MA, Ehrenreich JT, Suárez LM, Bennett SM, Cheron DM, et al. Identification of high-risk behaviors among victimized adolescents and implications for empirically supported psychosocial treatment. J Psychiatr Pract. 2006;12(6):364–83.

21. Fleming LC, Jacobsen KH. Bullying among middle-school students in low and middle income countries. Health Promot Int. 2010;25(1):73–84.

22. Carbone-Lopez K, Esbensen FA, Brick BT. Correlates and consequences of peer victimization: Gender differences in direct and indirect forms of bullying. Youth Violence Juv Justice. 2010;8(4):332–50.

23. Cogo-Moreira H, Gusmões JD, Valente JY, Eid M, Sanchez ZM. Does #Tamojunto alter the dynamic between drug use and school violence among youth? Secondary analysis from a large cluster-randomized trial. Eur Child Adolesc Psychiatry. 2021;

24. Young R, Sweeting H, West P. A longitudinal study of alcohol use and antisocial behaviour in young people. Alcohol and Alcoholism. 2008;43(2):204–14.

25. Kelly AB, Chan GCK, Toumbourou JW, O'Flaherty M, Homel R, Patton GC, et al. Very young adolescents and alcohol: Evidence of a unique susceptibility to peer alcohol use. Addictive Behaviors. 2012 Apr;37(4):414–9.

26. Devries K, Knight L, Petzold M, Merrill KG, Maxwell L, Williams A, et al. Who perpetrates violence against children? A systematic analysis of age-specific and sex-specific data. BMJ Paediatr Open. 2018 Jan 1;2(1).

27. Eyng AM, Gisi ML, Ens RT. VIOLÊNCIAS NAS ESCOLAS E REPRESENTAÇÕES SOCIAIS : um diálogo necessário no cotidiano escolar título Violence in schools and social representations : 2009;467–80.

28. Moore SE, Norman RE, Suetani S, Thomas HJ, Sly PD, Scott JG. Consequences of bullying victimization in childhood and adolescence: A systematic review and meta-analysis. World J Psychiatry. 2017;7(1):60.

29. Katsaras GN, Vouloumanou EK, Kourlaba G, Kyritsi E, Evagelou E, Bakoula C. Bullying and Suicidality in Children and Adolescents Without Predisposing Factors: A Systematic Review and Meta-analysis. Vol. 3, Adolescent Research Review. Springer; 2018. p. 193–217.

30. Farrington D, Loeber R, Stallings R, Ttofi MM. Bullying perpetration and victimization as predictors of delinquency and depression in the Pittsburgh Youth Study. Journal of Aggression, … [Internet]. 2011;3(2):74–81. Available from: http://www.emeraldinsight.com/journals.htm?articleid=1927702&show=abstract

31. Malta DC, Souza ER De, Silva MMA Da, Silva CDS, Andreazzi MAR De, Crespo C, et al. Vivência de violência entre escolares brasileiros: resultados da

Pesquisa Nacional de Saúde do Escolar (PeNSE). Cien Saude Colet. 2010;15:3053–63.

32. Mulla MM, Bogen KW, Orchowski LM. The mediating role of school connectedness in the associations between dating and sexual violence victimization and substance use among high school students. Vol. 139, Preventive Medicine. Academic Press Inc.; 2020.

33. Ttofi MM, Farrington DP, Losel F, Crago R v, Theodorakis N. School bullying and drug use later in life: A meta-analytic investigation. School Psychology Quarterly [Internet]. 2016;31(1):8–27. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=psyc11&AN=2015-15687-001%5Cnhttp://vq2st5lq8v.search.serialssolutions.com?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rfr_id=info:sid/Ovid:psyc11&rft.genre=article&rft_i

34. Reid RJ, Andrew Peterson N, Hughey J, Garcia-Reid P. School climate and adolescent drug use: Mediating effects of violence victimization in the urban high school context. Journal of Primary Prevention. 2006;27(3):281–92.

35. Fang L, Schiff M, Benbenishty R. Political violence exposure, adolescent school violence, and drug use: The mediating role of school support and posttraumatic stress. American Journal of Orthopsychiatry. 2016;86(6):662–70.

36. UNODC. International Standards on Drug Use Prevention. Viena; 2015.

37. Foxcroft DR, Tsertsvadze A. Universal family prevention programs for alcohol misuse in young people. Cochrane Database of Systematic Reviews. 2011;(5):CD009113.

38. Hanley S, Ringwalt C, Ennett ST, Vincus AA, Michael Bowling J, Haws SW, et al. The prevalence of evidence-based substance use prevention curricula in the nation's elementary schools 1. J Drug Educ. 2010;40(1):51–60.

39. Stephens PC, Sloboda Z, Stephens RC, Teasdale B, Grey SF, Hawthorne RD, et al. Universal school-based substance abuse prevention programs: Modeling targeted mediators and outcomes for adolescent cigarette, alcohol and marijuana use. Drug Alcohol Depend. 2009;102(1–3):19–29.

40. Strøm KK, Adolfsen F, Fossum S, Kaiser S, Martinussen M. Effectiveness of school-based preventive interventions on adolescent alcohol use: A meta-analysis of randomized controlled trials. Subst Abuse Treat Prev Policy. 2014;9(1):1–11.

41. Faggiano F, Vigna-Taglianti F, Versino E, Zambon A, Borraccino A, Lemma P. School-based prevention for illicit drugs' use. Cochrane Database of Systematic Reviews. 2005;(4).

42. Harrop E, Catalano RF. Evidence-Based Prevention for Adolescent Substance Use. Vol. 25, Child and Adolescent Psychiatric Clinics of North America. W.B. Saunders; 2016. p. 387–410.

43. Jackson C, Geddes R, Haw S, Frank J. Interventions to prevent substance use and risky sexual behaviour in young people: A systematic review. Addiction. 2012;107(4):733–47.

44. Werch CE, Owen DM. Iatrogenic effects of alcohol and drug prevention programs. J Stud Alcohol. 2002;63(5):581–90.

45. Lee NK, Cameron J, Battams S, Roche A. What works in school-based alcohol education: A systematic review. Health Educ J. 2016;75(7):780–98.

46. Sanchez ZM, Valente JY, Sanudo A, Pereira APD, Cruz JI, Schneider D, et al. The #Tamojunto Drug Prevention Program in Brazilian Schools: a Randomized Controlled Trial. Prevention Science. 2017;18(7):772–82.

47. Faggiano F, Galanti MR, Bohrn K, Burkhart G, Vigna-Taglianti F, Cuomo L, et al. The effectiveness of a school-based substance abuse prevention program: EU-Dap cluster randomised controlled trial. Prev Med (Baltim). 2008;47(5):537–43.

48. Sanchez ZM, Valente JY, Galvão PP, Gubert FA, Melo MHS, Caetano SC, et al. A cluster randomized controlled trial evaluating the effectiveness of the school-based drug prevention program #Tamojunto2.0. Addiction. 2021 Jun 1;116(6):1580–92.

49. Pentz MA. Evidence-Based Prevention: Characteristics, Impact, and Future Diretion. J Psychoactive Drugs. 2003;35:supl(April 2013):143–52.

50. UNODC - United Nations Office on Drugs and Crime, WHO - World Health Organization. International Standards on Drug Use Prevention Second updated edition. Viena; 2018.

51. da Silva FR, Assis SG. The prevention of violence in interdisciplinary programs implemented in Brazilian and Portuguese schools. Ciencia e Saude Coletiva. 2018 Sep 1;23(9):2899–908.

52. Thompkins A, Chauveron L, Harel O, Perkins D. Optimizing Violence Prevention Programs : An Examination of Program Effectiveness. Journal of School Health. 2014;84(7):435–43.

53. Bretherton D, Collins L, Ferretti C. Dealing with Conflict: Assessment of a Course for Secondary School Students. Aust Psychol. 1993;28(2):105–11.

54. Fagan AA, Catalano RF. What Works in Youth Violence Prevention: A Review of the Literature. Res Soc Work Pract. 2013;23(2):141–56.

55. Foshee VA, Bauman KE, Ennett ST, Suchindran C, Benefield T, Linder GF. Assessing the effects of the dating violence prevention program "safe dates" using random coefficient regression modeling. Prevention Science. 2005;6(3):245–58.

56. Bradshaw CP. Translating Research to Practice in Bullying Prevention.: @ Walden University Library. American Psychologist. 2015;70(4):322–32.

57. Cox E, Leung R, Baksheev G, Day A, Toumbourou JW, Miller P, et al. Violence Prevention and Intervention Programmes for Adolescents in Australia: A Systematic Review. Aust Psychol. 2016;51(3):206–22.

58. Mytton JA, DiGuiseppi C, Gough D, Taylor RS, Logan S. School-based secondary prevention programmes for preventing violence (Review). Cochrane Library. 2009;(4).

59. NIDA - NATIONAL INSTITUTE ON DRUG ABUSE. Preventing Drug Use Among Children and Adolescent: a research-based guide. Bethesda; 2003.

60. Botvin GJ, Griffin KW, Nichols TD. Preventing youth violence and delinquency through a universal school-based prevention approach. Prevention Science. 2006;7(4):403–8.

61. Hahn R, Fuqua-Whitley D, Wethington H, Lowy J, Crosby A, Fullilove M, et al. Effectiveness of Universal School-Based Programs to Prevent Violent and Aggressive Behavior. A Systematic Review. Am J Prev Med. 2007;33(2 SUPPL.).

62. Foshee VA, McNaughton Reyes HL, Ennett ST, Suchindran C, Mathias JP, Karriker-Jaffe KJ, et al. Risk and protective factors distinguishing profiles of adolescent peer and dating violence perpetration. Journal of Adolescent Health. 2011;48(4):344–50.

63. Steckler AB, Linnan L, Israel B. Process evaluation for public health interventions and research. San Francisco, CA: Jossey-Bass; 2002.

64. Flay BR, Biglan A, Boruch RF, Gonz F, Gottfredson D, Kellam S, et al. Standards of Evidence : Criteria for Efficacy , Effectiveness and Dissemination. 2005;6(3).

65. Beasley LO, Silovsky JF, Owora A, Burris L, Hecht D, DeMoraes-Huffine P, et al. Mixed-methods feasibility study on the cultural adaptation of a child abuse prevention model. Child Abuse Negl. 2014;38(9):1496–507.

66. Donabedian A. An introduction to quality assurance in health care. Oxford University Press; 2002.

67. Rohrbach LA, Dent CW, Skara S, Sun P, Sussman S. Fidelity of implementation in project towards no drug abuse (TND): A comparison of classroom teachers and program specialists. Prevention Science. 2007;8(2):125–32.

68. McDavid JC, Huse I, Hawthorn LR. Program evaluation and performance measurement: An introduction to practice. Sage Publications; 2018.

69. Moncher FJ, Prinz RJ. TREATMENT STUDIES IN OUTCOME. 1991;11:247–66.

70. Yeaton WH, Sechrest L. Critical Dimensions in the Choice and Maintenance of Successful Treatments : Strength , Integrity , and Effectiveness. 1981;49(2):156–67.

71. Lynch S, Donnell CO. The Evolving Definition , Measurement , and Conceptualization of Fidelity of Implementation in Scale-up of Highly Rated Science Curriculum Units in Diverse Middle Schools. 2005;(January).

72. Ruiz-Primo MA. A Multi-Method and Multi-Source Approach for Studying Fidelity of Implementation. Vol. 1522, CSE Report 677. 2006.

73. Keller-margulis MA. Fidelity of implementation framework: a critical need for response to intervention models. 2012;49(4):342–52.

74. Khoury CR, Mcintosh K, Hoselton R. An Investigation of Concurrent Validity of Fidelity of Implementation Measures at Initial Years of Implementation. 2019;40(1):23–31.

75. Broderick PC, Schussler DL. Exploring Fidelity in School-Based Mindfulness Programs. Glob Adv Health Med. 2021 Dec 12;10.

76. Evans RE, Moore G, Movsisyan A, Rehfuess E. How can we adapt complex population health interventions for new contexts? Progressing debates and research priorities. J Epidemiol Community Health (1978). 2021 Jan 1;75(1):40–5.

77. Pickard K, Mellman H, Frost K, Reaven J, Ingersoll B. Balancing Fidelity and Flexibility: Usual Care for Young Children With an Increased Likelihood of Having Autism Spectrum Disorder Within an Early Intervention System. J Autism Dev Disord. 2021;

78. Movsisyan A, Arnold L, Evans R, Hallingberg B, Moore G, O'Cathain A, et al. Adapting evidence-informed complex population health interventions for new contexts: A systematic review of guidance. Vol. 14, Implementation Science. BioMed Central Ltd.; 2019.

79. Castro FG, Barrera M, Martinez CR. The Cultural Adaptation of Prevention Interventions: Resolving Tensions Between Fidelity and Fit. Prevention Science. 2004;5(1):41–5.

80. Melo MH da S, Freitas I da S, Brandão LC, Gubert F do A, Rebouças LN, Sanchez Z van der M. Evaluation of the Implementation Process of the #Tamojunto2.0 Prevention Program in Brazilian Schools. School and Educational Psychology. 2022;32.

81. Century J, Rudnick M, Freeman C. A Framework for Measuring Fidelity of Implementation : A Foundation for Shared Language and Accumulation of Knowledge. 2010;199–218.

82. Dusenbury L, Brannigan R, Falco M, Hansen WB. A review of research on fidelity of implementation : implications for drug abuse prevention in school settings. 2003;18(2):237–56.

83. Medeiros PFP, Cruz JI, Schneider D, Sanudo A, Sanchez ZM. Process evaluation of the implementation of the Unplugged Program for drug use prevention in Brazilian schools. Subst Abuse Treat Prev Policy. 2016;11(1):1–11.

84. Shamblen SR, Courser MW, Abadi MH, Johnson KW, Young L, Browne TJ. An international evaluation of DARE in São Paulo, Brazil. Drugs: Education, Prevention and Policy. 2014;21(2):110–9.

85. Pan W, Bai H. A multivariate approach to a meta-analytic review of the effectiveness of the D.A.R.E. program. Int J Environ Res Public Health. 2009;6(1):267–77.

86. Lynam D, Milich R, Martin C, Logan TK, Zimmerman R, Novak SP, et al. Project DARE: No effects at 10-year follow-up. J Consult Clin Psychol. 1999;67(4):590–3.

87. Marsiglia FF, Hecht ML. Keepin'it REAL: An evidence-based program. Santa Cruz, CA: ETR Associates. 2005;

88. PROERD. Manual do Instrutor do 7º ano: Caindo na REAL / University of Arizona; PMMG; tradução coordenada por Bárbara G. J. Miranda. Belo Horizonte: PMMG; 2013.

89. PROERD. Currículo para crianças do 5º ano do ensino fundamental: Caindo na REAL / D.A.R.E. America; PMMG; tradução de Silas Tiago O. Melo e Soraya Érica Rodrigues Matoso. Belo Horizonte: PMMG; 2015.

90. PROERD. Currículo para crianças do 5º ano do ensino fundamental: Caindo na REAL / D.A.R.E. America. PMMG, editor. Belo Horizonte; 2015.

91. Hoffman DM. Reflecting on Social Emotional Learning: A Critical Perspective on Trends in the United States. Rev Educ Res. 2009;79(2):533–56.

92. Durlak JA, Weissberg RP, Dymnicki AB, Taylor RD, Schellinger KB. The Impact of Enhancing Students' Social and Emotional Learning: A Meta-Analysis of School-Based Universal Interventions. Child Dev. 2011;82(1):405–32.

93. Harthun ML, Dustman PA, Reeves LJ, Marsiglia FF, Hecht ML. Using Community-based Participatory Research to Adapt keepin' it REAL: Creating a Socially, Developmentally, and Academically Appropriate Prevention Curriculum for 5th Graders. J Alcohol Drug Educ. 2009;53(3):12–38.

94. Gosin M, Marsiglia FF, Hecht ML. keepin' it R.E.A.L. : A Drug Resistance Curriculum Tailored to the Strengths and Needs of Pre-Adolescents of the Southwest. J Drug Educ. 2003;33(2):119–42.

95. Spitzberg BH, Hecht ML. a Component Model of Relational Competence. Hum Commun Res. 1984;10(4):575–99.

96. Marsiglia FF, ZORITA P. Narratives as a Means to Support Latino/a Students in Higher Education. Reflections. 1996;2(1):54–62.

97. Cialdini RB, Reno RR, Kallgren CA. A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. J Pers Soc Psychol. 1990;58(6):1015–26.

98. Botvin GJ. Substance Abuse Prevention Research: Recent Developments and Future Directions. Journal of School Health. 1986;56(9):369–74.

99. Valente JY, Galvão PP de O, Gusmoes JDSP, Sanchez ZM. Revisão sistemática sobre o efeito do programa escolar de prevenção ao uso de drogas Keepin' it REAL: traduzido e implementado no Brasil pelo PROERD. Cien Saude Colet. 2022 Nov;27(11):4175–89.

100. Hecht ML, Marsiglia FF, Elek E, Wagstaff DA, Kulis S, Dustman P, et al. Culturally Grounded Substance Use Prevention: An Evaluation of the keepin' it R.E.A.L. Curriculum Michael. Prevention Science. 2003;4(4):233–48.

101. Kulis S, Nieri T, Yabiku S, Stromwall LK, Marsiglia FF. Promoting reduced and discontinued substance use among adolescent substance users: Effectiveness of a universal prevention program. Prevention Science. 2007;8(1):35–49.

102. Warren JR, Hecht ML, Wagstaff DA, Ndiaye K, Dustman P, Marsiglia FF. Journal of Applied Communication Communicating Prevention : The Effects of the keepin ' it REAL Classroom Videotapes and Televised PSAs on Middle-School Students ' Substance Use. 2007;(October 2014):37–41.

103. Kulis S, Yabiku ST, Marsiglia FF, Nieri T, Crossman A. DIFFERENCES BY GENDER, ETHNICITY, AND ACCULTURATION IN THE EFFICACY OF THE keepin' it REAL MODEL PREVENTION PROGRAM*. J Drug Educ. 2007;37(2):123–44.

104. Kulis SS, Ayers SL, Harthun ML. Substance Use Prevention for Urban American Indian Youth: A Efficacy Trial of the Culturally Adapted Living in 2 Worlds Program. Journal of Primary Prevention. 2017 Apr 1;38(1–2):137–58.

105. Marsiglia FF, Booth JM, Ayers SL, Nuño-Gutierrez BL, Kulis S, Hoffman S. Short-Term Effects on Substance Use of the Keepin' It REAL Pilot Prevention Program: Linguistically Adapted for Youth in Jalisco, Mexico. Prevention Science. 2014 Oct 1;15(5):694–704.

106. Hecht ML. Designed Cultural Adaptation and Delivery Quality in Rural Substance Use Prevention : an Effectiveness Trial for the Keepin ' it REAL Curriculum. 2018;(2016).

107. Kulis SS, Marsiglia FF, Porta M, Arévalo Avalos MR, Ayers SL. Testing the keepin' it REAL Substance Use Prevention Curriculum Among Early Adolescents in Guatemala City. Prevention Science. 2019 May 15;20(4):532–43.

108. Kulis S, Marsiglia FF, Elek E, Dustman P, Wagstaff DA, Hecht ML. Mexican/Mexican American Adolescents and keepin' it REAL: An Evidence-Based Substance Use Prevention Program. Child Sch. 2005 Jul;27(3):133–45.

109. Marsiglia FF, Kulis SS, Booth JM, Nuño-Gutierrez BL, Robbins DE. Long-Term Effects of the keepin' it REAL Model Program in Mexico: Substance Use Trajectories of Guadalajara Middle School Students. Journal of Primary Prevention. 2015 Apr 1;36(2):93–104.

110. Hecht ML, Shin YJ, Pettigrew J, Miller-Day M, Krieger JL. Designed Cultural Adaptation and Delivery Quality in Rural Substance Use Prevention: an Effectiveness Trial for the Keepin' it REAL Curriculum. Prevention Science. 2018 Nov 1;19(8):1008–18.

111. Kulis SS, Garcia-Perez H, Marsiglia FF, Ayers SL. Testing a Culturally Adapted Youth Substance Use Prevention Program in a Mexican Border City: Mantente REAL. Subst Use Misuse. 2020;56(2):245–57.

112. Elek E, Wagstaff DA, Hecht ML. Effects of the 5th and 7th grade enhanced versions of the keepin' it real substance use prevention curriculum. J Drug Educ. 2010 Jan 1;40(1):61–79.

113. Marsiglia FF, Kulis S, Yabiku ST, Nieri TA, Coleman E. When to Intervene: Elementary School, Middle School or Both? Effects of keepin' It REAL on Substance Use Trajectories of Mexican Heritage Youth. Prevention Science. 2011 Mar 1;12(1):48–62.

114. Marsiglia FF, Kulis S, Yabiku ST, Nieri TA, Coleman E. When to Intervene : Elementary School , Middle School or Both ? Effects of keepin ' It REAL on Substance Use Trajectories of Mexican Heritage Youth. 2011;48–62.

115. Kulis S, Marsiglia FF, Elek E, Dustman P, Wagstaff DA, Hecht ML. Mexican/Mexican American Adolescents and keepin' it REAL: An Evidence-Based Substance Use Prevention Program. Child Sch. 2005;25(3):133–45.

116. Kulis SS, Marsiglia FF, Medina-Mora ME, Nuño-Gutiérrez BL, Corona MD, Ayers SL. Keepin' It REAL—Mantente REAL in Mexico: a Cluster Randomized Controlled Trial of a Culturally Adapted Substance Use Prevention Curriculum for Early Adolescents. Prevention Science. 2021 Jul 1;22(5):645–57.

117. Kulis S, Marsiglia FF, Elek E, Wagstaff DA, Hecht ML. Mexican/Mexican American Adolescents and keepin' it REAL: An Evidence-Based Substance Use Prevention Program. Vol. 27, Child Sch. 2005.

118. Hecht ML, Elek E, Wagstaff DA, Kam JA, Marsiglia F, Dustman P, et al. Immediate and short-term effects of the 5th grade version of the keepin' it real substance use prevention intervention. J Drug Educ. 2008;38(3):225–51.

119. Hecht ML, Elek E, Wagstaff DA, Kam JA, Marsiglia F, Dustman P, et al. IMMEDIATE AND SHORT-TERM EFFECTS OF THE 5 TH GRADE VERSION OF THE keepin ' it REAL SUBSTANCE USE PREVENTION INTERVENTION *. 2008;38(3):225–51.

120. Sanchez ZM, Valente JY, Gusmões JDP, Ferreira-Junior V, Caetano SC, Cogo-Moreira H, et al. Effectiveness of a school-based substance use prevention program taught by police officers in Brazil: Two cluster randomized controlled trials of the PROERD. International Journal of Drug Policy [Internet]. 2021;98:103413. Available from: https://doi.org/10.1016/j.drugpo.2021.103413

121. Valente JY, Sanchez ZM. Short - Term Secondary Effects of a School - Based Drug Prevention Program : Cluster - Randomized Controlled Trial of the

Brazilian Version of DARE ' s Keepin ' it REAL. Prevention Science [Internet]. 2021;(0123456789). Available from: https://doi.org/10.1007/s11121-021-01277-w

122. Valente JY, Sanchez ZM. Mediating Factors of a Brazilian School-Based Drug Prevention Program. Int J Ment Health Addict. 2022;

123. Creswell JW, Creswell JD. Research design: Qualitative, quantitative, and mixed methods approaches. 3 ed. EUA: Sage Publications; 2009.

124. Patton MQ. Qualitative research. Wiley Online Library; 2005.

125. Minayo MC de S, Deslandes SF, Gomes RC. Pesquisa social: teoria, método e criatividade. Pesquisa social: teoria, método e criatividade. 2015;

126. Donner A, Klar N. Design and analysis of cluster randomized trials in health research. Stat Med. 2000;22(1):329–496.

127. Guilheri J, Cogo-Moreira H, Kubiszewski V, Yazigi L, Andronikof A. Bullying in school: Construct validity of the French version of the Olweus revised Bully/victim Questionnaire (rBVQ). Neuropsychiatr Enfance Adolesc. 2015 Jun 1;63(4):211–7.

128. Sanchez ZM, Sanudo A, Andreoni S, Schneider D, Pereira APD, Faggiano F. Efficacy evaluation of the school program Unplugged for drug use prevention among Brazilian adolescents. BMC Public Health. 2016;16(1):1–9.

129. Ahn C, Heo M, Zhang S. Sample size calculations for clustered and longitudinal outcomes in clinical research. CRC Press; 2014.

130. Sanchez ZM, Valente JY, Sanudo A, Pereira APD, Cruz JI, Schneider D, et al. The #Tamojunto Drug Prevention Program in Brazilian Schools: a Randomized Controlled Trial. Prevention Science. 2017 Oct;18(7):772–82.

131. Levenshtein VI. Binary codes capable of correcting deletions, insertions and reversals. Dokl Akad Nauk SSSR. 1965;10(8):845–8.

132. Medeiros PFP, Cruz JI, Schneider D, Sanudo A, Sanchez ZM. Process evaluation of the implementation of the Unplugged Program for drug use prevention in Brazilian schools. Subst Abuse Treat Prev Policy. 2016 Jan 7;11(1).

133. Prado MCDO, Schneider DR, Sañudo A, Pereira APD, Horr JF, Sanchez ZM. Transcultural adaptation of questionnaire to evaluate drug use among students: The use of the EU-dap european questionnaire in Brazil. Subst Use Misuse. 2016;51(4):449–58.

134. CEBRID - Centro Brasileiro de Informações sobre Drogas Psicotrópicas. VI Levantamento Nacional sobre o Consumo de Drogas Psicotrópicas entre Estudantes do Ensino Fundamental e Médio das Redes Pública e Privada de Ensino nas 27 Capitais Brasileiras. 2010.

135. IBGE - Instituto Brasileiro de Geografia e Estatística. Pesquisa Nacional de Saúde do Escolar2011. Rio de Janeiro; 2012.

136. Galanti MR, Siliquini R, Cuomo L, Melero JC, Panella M, Faggiano F. Testing anonymous link procedures for follow-up of adolescents in a school-based trial: The EU-DAP pilot study. Prev Med (Baltim). 2007;44(2):174–7.

137. Beroho M, Briak H, el Halimi R, Ouallali A, Boulahfa I, Mrabet R, et al. Analysis and prediction of climate forecasts in Northern Morocco: application of multilevel linear mixed effects models using R software. Heliyon. 2020 Oct 1;6(10).

138. Who - World Health Organization. Qualitative research for health programmes. 1994. p. 99.

139. Patton MQ. Qualitative research and evaluation methods. 3rd Editio. Thousand Oaks: Sage Publications; 2002.

140. Fereday J, Muir-Cochrane E. Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. Int J Qual Methods. 2006;5(1).

141. Strauss A, Corbin J. Bases de la investigación cualitativa - técnicas y procedimientos para desarrollar la teoría fundamentada. 2012.

142. Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, et al. Global burden of disease attributable to mental and substance use disorders: Findings from the Global Burden of Disease Study 2010. The Lancet. 2013;382(9904):1575–86.

143. Gosin M, Francisco Marsiglia F, Hecht ML. keepin' it R.E.A.L.: A DRUG RESISTANCE CURRICULUM TAILORED TO THE STRENGTHS AND NEEDS OF PRE-ADOLESCENTS OF THE SOUTHWEST. Vol. 33, J. DRUG EDUCATION. 2003.

144. Michael L. Hecht, Flavio Francisco Marsiglia, Elvira Elek, David A. Wagstaff, Stephen Kulis, Patricia Dustman, et al. Culturally Grounded Substance Use Prevention: An Evaluationof thekeepin' it R.E.A.L.Curriculum. Prevention Science. 2003;4(4):233–48.

145. Kulis SS, Marsiglia FF, Medina-Mora ME, Nuño-Gutiérrez BL, Corona MD, Ayers SL. Keepin' It REAL—Mantente REAL in Mexico: a Cluster Randomized Controlled Trial of a Culturally Adapted Substance Use Prevention Curriculum for Early Adolescents. Prevention Science. 2021 Jul 1;22(5):645–57.

146. Kulis SS, Marsiglia FF, Porta M, Arévalo Avalos MR, Ayers SL. Testing the keepin' it REAL Substance Use Prevention Curriculum Among Early Adolescents in Guatemala City. Prevention Science. 2019 May 15;20(4):532–43.

147. Cutrín O, Kulis S, Maneiro L, MacFadden I, Navas MP, Alarcón D, et al. Effectiveness of the Mantente REAL Program for Preventing Alcohol Use in Spanish Adolescents. Psychosocial Intervention. 2021 Sep 1;30(3):113–22.

148. Hecht ML, Shin YJ, Pettigrew J, Miller-Day M, Krieger JL. Designed Cultural Adaptation and Delivery Quality in Rural Substance Use Prevention: an

Effectiveness Trial for the Keepin' it REAL Curriculum. Prevention Science. 2018 Nov 1;19(8):1008–18.

149. Elek E, Wagstaff DA, Hecht ML. Effects of the 5th and 7th grade enhanced versions of the keepin' it real substance use prevention curriculum. J Drug Educ. 2010 Jan 1;40(1):61–79.

150. Marsiglia FF, Kulis S, Yabiku ST, Nieri TA, Coleman E. When to Intervene: Elementary School, Middle School or Both? Effects of keepin' It REAL on Substance Use Trajectories of Mexican Heritage Youth. Prevention Science. 2011 Mar 1;12(1):48–62.

151. Pereira APD, Sanchez ZM. Characteristics of school-based drug prevention programs in Brazil. Ciencia e Saude Coletiva. 2020 Aug 1;25(8):3131–42.

152. Sanchez ZM, Valente JY, Gusmões JDP, Ferreira-Junior V, Caetano SC, Cogo-Moreira H, et al. Effectiveness of a school-based substance use prevention program taught by police officers in Brazil: Two cluster randomized controlled trials of the PROERD. International Journal of Drug Policy. 2021 Dec 1;98.

153. Valente JY, Galvão PP de O, Gusmoes JDSP, Sanchez ZM. Revisão sistemática sobre o efeito do programa escolar de prevenção ao uso de drogas Keepin' it REAL: traduzido e implementado no Brasil pelo PROERD. Cien Saude Colet. 2022 Nov;27(11):4175–89.

154. Gusmoes JD, Garcia-Cerde R, Valente JY, Pinsky I, Sanchez ZM. Implementation fidelity of a Brazilian drug use prevention program and its effect among adolescents: a mixed-methods study. Subst Abuse Treat Prev Policy. 2022 Dec 1;17(1).

155. Hill HC, Erickson A. Using Implementation Fidelity to Aid in Interpreting Program Impacts: A Brief Review. Educational Researcher. 2019 Dec 1;48(9):590–8.

156. Evans RE, Moore G, Movsisyan A, Rehfuess E. How can we adapt complex population health interventions for new contexts? Progressing debates and research priorities. J Epidemiol Community Health (1978). 2021 Jan 1;75(1):40–5.

157. Griner D, Smith TB. Culturally adapted mental health intervention: A meta-analytic review. Special issue: Culture, race, and ethnicity in psychotherapy. Vol. 43, Psychotherapy. 2006. p. 531–48.

158. Miller-Day M, Pettigrew J, Hecht ML, Shin YJ, Graham J, Krieger J. How prevention curricula are taught under real-world conditions: Types of and reasons for teacher curriculum adaptations. Health Educ. 2013 Jun;113(4):324–44.

159. Miller-Day M, Hecht ML. Narrative Means to Preventative Ends: A Narrative Engagement Framework for Designing Prevention Interventions. Health Commun. 2013 Oct;28(7):657–70.

160. Hecht ML, Krieger JLR. The principle of cultural grounding in school-based substance abuse prevention: The drug resistance strategies project. J Lang Soc Psychol. 2006 Sep;25(3):301–19.

161. Botvin GJ. Substance Abuse Prevention Research: Recent Developments and Future Directions. Journal of School Health. 1986;56(9):369–74.

162. Patton MQ. Qualitative research and evaluation methods. Thousand Oaks. Cal.: Sage Publications; 2002.

163. OECD. Education in Brazil: An International Perspective. Paris; 2021.

164. Nobre GC, Valentini NC, Nobre FSS. Fundamental motor skills, nutritional status, perceived competence, and school performance of Brazilian children in social vulnerability: Gender comparison. Child Abuse Negl. 2018 Jun 1;80:335–45.

165. Chakraborti-Ghosh S, Orellana KM, Jones J. A CROSS-CULTURAL COMPARISON OF TEACHERS' PERSPECTIVES ON INCLUSIVE EDUCATION THROUGH A STUDY ABROAD PROGRAM IN BRAZIL AND IN THE US [Internet]. Vol. 29, INTERNATIONAL JOURNAL OF SPECIAL EDUCATION. 2014. Available from: www.youtube.com/watch?v=VrOvE0eaF-0

166. Skaalvik EM, Skaalvik S. Still motivated to teach? A study of school context variables, stress and job satisfaction among teachers in senior high school. Social Psychology of Education. 2017 Mar 1;20(1):15–37.

167. Ijadi-Maghsoodi R, Marlotte L, Garcia E, Aralis H, Lester P, Escudero P, et al. Adapting and Implementing a School-Based Resilience-Building Curriculum Among Low-Income Racial and Ethnic Minority Students. Contemp Sch Psychol. 2017 Sep;21(3):223–39.

168. Caldwell LL, Smith EA, Collins LM, Graham JW, Lai M, Wegner L, et al. Translational Research in South Africa: Evaluating Implementation Quality Using a Factorial Design. Child Youth Care Forum. 2012 Apr;41(2):119–36.

169. Dusenbury L, Hansen WB, Jackson-Newsom J, Pittman DS, Wilson C v., Nelson-Simley K, et al. Coaching to enhance quality of implementation in prevention. Health Educ. 2010 Jan 1;110(1):43–60.

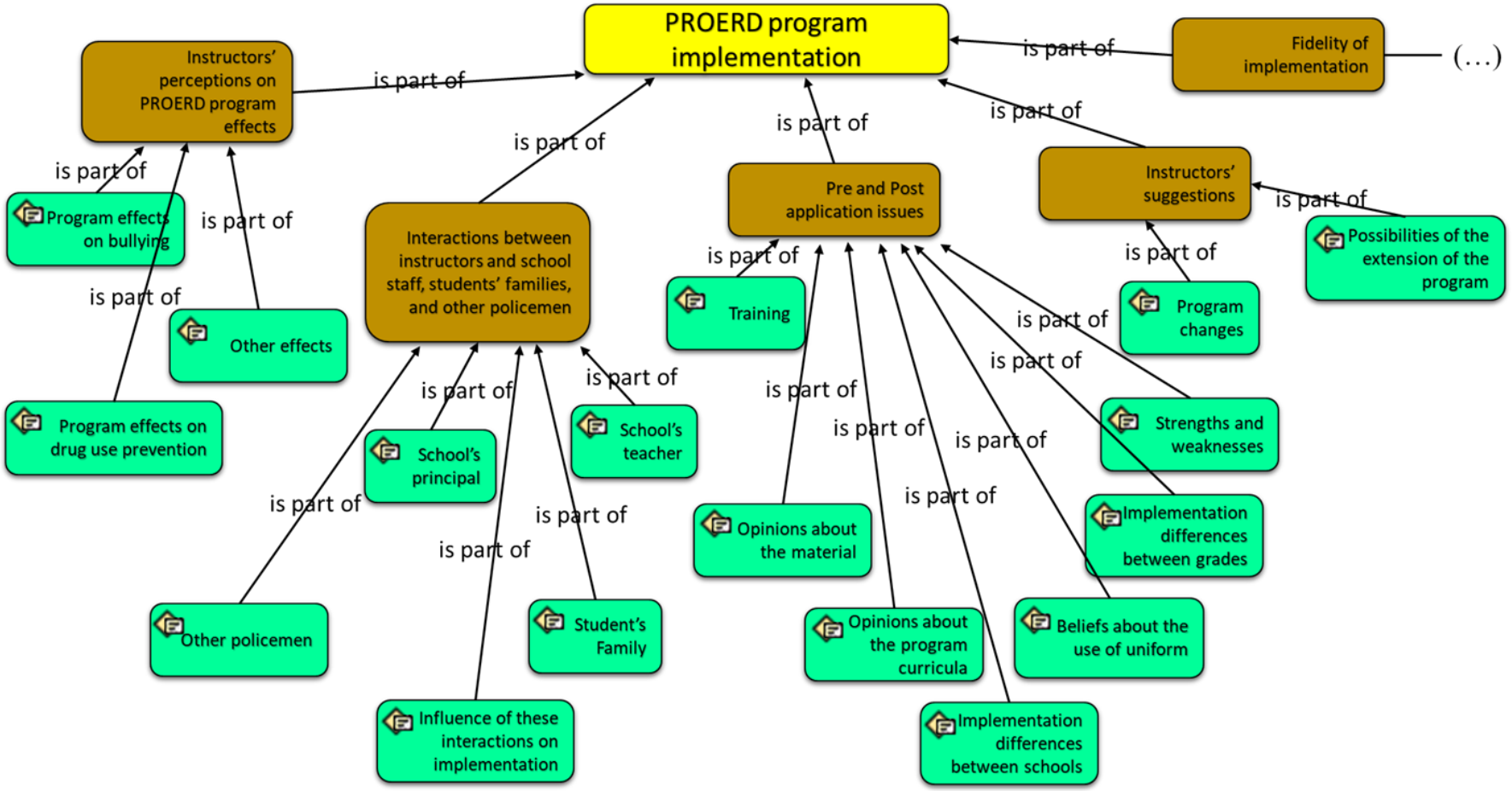
170. Downer JT, Locasale-Crouch J, Hamre B, Pianta R. Teacher characteristics associated with responsiveness and exposure to consultation and online professional development resources. Early Educ Dev. 2009;20(3):431–55.

171. Collins LM, Baker TB, Mermelstein RJ, Piper ME, Jorenby DE, Smith SS, et al. The multiphase optimization strategy for engineering effective tobacco use interventions. In: Annals of Behavioral Medicine. 2011. p. 208–26.

172. Daniel JZ, Hickman M, Macleod J, Wiles N, Lingford-Hughes A, Farrell M, et al. Is socioeconomic status in early life associated with drug use? A systematic review of the evidence. Drug Alcohol Rev. 2009 Mar;28(2):142–53.

173. Dusenbury L, Brannigan R, Falco M, Hansen WB. A review of research on fidelity of implementation: implications for drug abuse prevention in school settings laborate to develop ways of introducing flexibil-ity into prevention programs [Internet]. Vol. 18, HEALTH EDUCATION RESEARCH. 2003. Available from: http://her.oxfordjournals.org/

Figure 1. Code tree including the used and non-used codes.



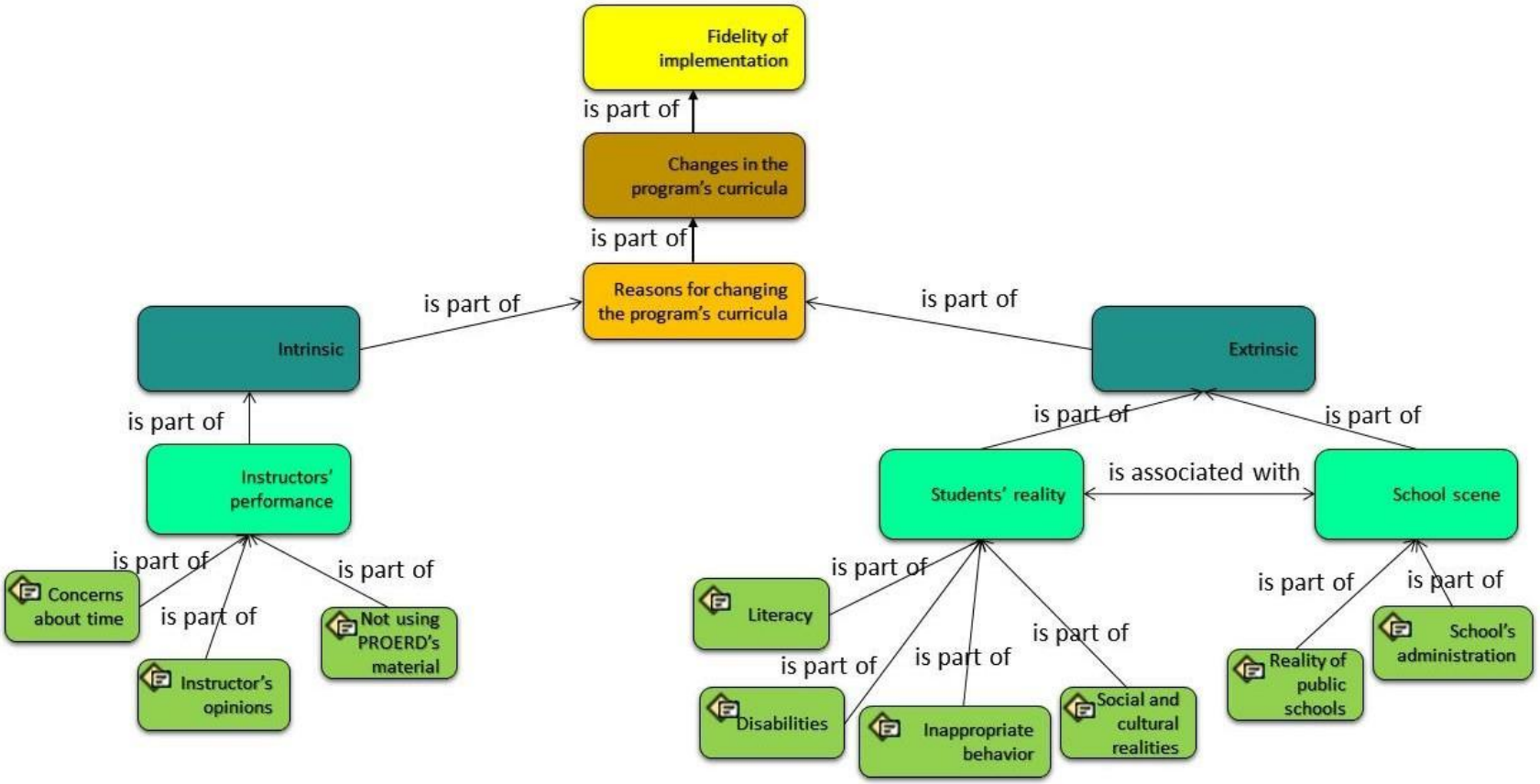

Fidelity of implementation
is part of
Changes in the program's curricula
is part of
Reasons for changing the program's curricula
is part of
Intrinsic
is part of
Extrinsic
is part of
Instructors' performance
is part of
Concerns about time
is part of
Instructor's opinions
is part of
Not using PROERD's material
is part of
Students' reality
is associated with
School scene
is part of
Literacy
is part of
Disabilities
is part of
Inappropriate behavior
is part of
Social and cultural realities
is part of
Reality of public schools
is part of
School's administration

Table 1. Characteristics of study participants (n = 19) and type of alteration made.

Participant	Sex (M/F)	Age (years)	Education level[b]	Position in police hierarchy[a]	Years teaching PROERD	Alterations (yes/no)	Type of alteration
P01	F	42	-	Cabo	5	Yes	Extrinsic
P02	F	26	High School	Soldado	1	Yes	Intrinsic and extrinsic
P03	M	32	High School	Cabo	5	Yes	Intrinsic and extrinsic
P04	M	45	High School	Cabo	14	Yes	Intrinsic and extrinsic
P05	M	40	High School	Cabo	15	Yes	Intrinsic and extrinsic
P06	M	38	High School	Cabo	11	Yes	Intrinsic and extrinsic
P07	M	42	Universitary	Cabo	6	Yes	Intrinsic and extrinsic
P08	M	32	High School	Soldado	<1	Yes	Extrinsic
P09	M	42	High School	Cabo	7	Yes	Extrinsic
P10	M	39	High School	Cabo	4	Yes	Extrinsic
P11	F	47	High School	Cabo	10	Yes	Intrinsic and extrinsic
P12	F	40	High School	Cabo	2	Yes	Intrinsic
P13	M	34	High School	Soldado	4	Yes	Extrinsic
P14	M	33	Under graduation	Cabo	1	Yes	Extrinsic
P15	M	46	High School	Cabo	9	Yes	Intrinsic and extrinsic
P16	M	-	High School	Cabo	9	Yes	Intrinsic and extrinsic
P17	F	48	Under graduation	Cabo	19	Yes	Extrinsic
P18	F	48	Under graduation	Cabo	21	Yes	Extrinsic
P19	F	49	Graduation	Cabo	10	Yes	Intrinsic and extrinsic

a-Soldado is the lowest level in the Military Police hierarchy. Cabo is the following level. So, Soldado and Cabo are the two lowest level in the hierarchy.

b- We have transfomed the Brazilian category to the US pattern. So High School includes also the officers that have started a college but did not received a degree. Undergradution is the first degree that universities offer, and Graduation is the higher level (master and doctoral degrees).

Table 2: Main results of the analysis regarding the changes done by the police instructors participating in the study (N=19).

Type	Topic	Subtopic	Description	Golden quotes
Extrinsic	Students' reality	Literacy	Changes in the activities made by the instructors because the students do not know how to write or read properly.	*"There is something* [to do] *from the instructor's manual and when you come here* [at the school], *it's another reality. Some* [students] *have difficulty doing it, they are not reading and writing yet, so…" P16*
		Disabilities	Changes in the activities made by the instructors because they do not know how to deal with students with disabilities.	*"We don't know how to work with special students, especially the autistic ones, the blind -there's not a lot of blind ones -, but more the autistic ones and also, how to work with 5th grade students who can't read or write. We adapt, right?" P03*
		Inappropriate behavior	Difficulties to follow the manual because of the misbehavior of students.	*"There are classes that you cannot work with groups. The 7th grade students are bigger, they think they are adults already, anyway..." P02*
		Social and cultural realities	Differences between the PROERD's material and the students' reality that led to changes in the activities.	*"For the 7th grade, I think the workbook has nothing to do with our reality in Brazil, because it is a workbook that came from the United States, translated into our reality here, which is completely different. I don't know how is like there in the United States, but from the material, from the video, it has nothing to do with our reality." P01*
	School scene	Reality of public schools	Instructors addressed the difficulties with applying the program in public schools that lack material and media resources.	*"Sometime the director or the school staff want to collaborate* [with PROERD's application], *but the school's infrastructure does not help. We get stuck." P01*
		Schools' administration	Difficulties to apply the program addressed by the instructors concerning the schools' administration	*"Every time I get there* [at this school] *there's no* [PROERD'S]*class. There's some meeting, there's some test, I don't know… they* [the school's administration] *always find a way to disturb my classes there." P02*
Intrinsic	Instructors' performance	Concerns about time	Changes in the program because ether a lot or none concerns about time	*"Instructor did not apply the activity "Effective Communication" from Lesson 7 (5th grade)- He took the class calmly in no hurry to finish everything today. Finished lesson 6 at the beginning of the class." (Reseacher notes)*
		Instructor's opinions	Instructors that did not stick to the PROERD's material or theory.	*"Instructor said the scientific data from CEBRID presented in Lesson 8 (7th grade) where not correct" (Researcher notes)*
		Not using PROERD's material	Instructors that did not follow the manual	*"Instructor talked mostly about her personal life during Lesson 10 (7th grade)" (Researcher notes)*

Anex S1: Semi-structured interview script for police officers

Sex, age, education level, police rank, years teaching PROERD.

Initial Context

1. How and why did you join PROERD?
   In your opinion, what are the effects of PROERD on participating children (5th and 7th grades) and how do you perceive it?

Relations

2. What do you think about the alignment between school management and classroom work for program implementation? Conveniences and Difficulties.
3. How can these relationships influence the program effects?

Program Implementation

4. Was the received training sufficient? Why?
5. How does it (the training) influence your practice? Why?
6. What is your opinion about the manuals? Do you think they is suitable for the age groups?
7. How does the manual support class planning?
8. Is the program content suitable for the age groups?
9. What does and does not work for the students? What are the conveniences and difficulties found in the classroom? What activities are most accepted and least accepted by students?
10. Is it different to implement the curricula for the fifth and seventh grades? Why?
11. How does the demands of the program implementation (class planning, relationship with the principals and pedagogical coordination) influence your daily life as a police officer and vice vesa (how does your daily life as a police officer influence the program implementation)?

Sugestions

12. What would you change in the program?

What are the lessons learned that can help expanding the project?

7. Considerações Finais

A presente tese investigou a fidelidade de implementação do PROERD e sua influência no efeito do programa em relação ao uso de drogas. Embora cada artigo se estruture de formas diferentes, ambos convergem com contribuições para uma melhor compreensão da aplicação do programa na realidade brasileira, mais especificamente, de escolas públicas de São Paulo.

Apesar do efeito nulo da fidelidade no uso de drogas entre adolescentes, os resultados qualitativos evidenciaram que o PROERD não é aplicado de acordo com as diretrizes dos desenvolvedores do programa e que os policiais instrutores fazem diferentes alterações durante a implementação para viabilizar a aplicação .

Devido à falta de infraestrutura escolar, falta de apoio de diretores, coordenadores e professores, dificuldades de aprendizagem dos alunos e realidade social em que eles estão inseridos, os instrutores realizam alterações nas lições, excluindo atividades ou adicionando temas não previstos.

Além disso, foram encontradas influências da própria instituição da Polícia Militar para a boa aplicação do programa, tendo em vista que os instrutores podem ter seus trabalhos dificultados ou facilitados conforme a visão que seus superiores têm do PROERD. Também faz-se importante ressaltar que os instrutores passam por um treinamento de 40 horas, porém muitas das alterações realizadas são devido à falta de capacitação pedagógica dos mesmos, sugerindo a necessidade de uma revisão da formação e de um canal de apoio para estes instrutores se manterem atualizados e em acordo com o previsto pelos desenvolvedores. Aplicar programas em sala de aula para crianças e adolescente depende de habilidades pedagógicas que não são adquiridas em formações rápidas.

De uma maneira geral, todos os achados desta tese corroboram com a literatura no que diz respeito à adaptação cultural de programas escolares de prevenção ao uso de drogas. O programa é muito bem visto pela sociedade e os policiais envolvidos têm carinho pelos alunos e pelo trabalho na escola, porém, os aspectos práticos da aplicação do PROERD não estão de acordo com a realidade das escolas públicas brasileiras e de seus alunos. Os policiais instrutores precisam viabilizar as aulas sem computadores, projetores de vídeo e em salas de aula onde grande parte dos alunos possuem atraso na alfabetização. Nesse contexto, os instrutores aplicam uma ideia do que é o PROERD, e não o programa com seus componentes previstos, como vídeos, leitura e discussões.

Ainda assim, o PROERD apresenta uma capilaridade e sustentabilidade nacional que nenhum programa conseguiu, o que é um ponto fortíssimo deste programa. Também, o fato de o programa ser aplicado por instrutores externos à escola não sobrecarrega os professores e pode contribuir com uma aplicação mais fiel. Com isso, uma alternativa seria a manutenção do programa, com uma reformulação do material a nível cultural e educacional. Para isso, seria necessária a parceria da PM com uma universidade nacional que mantivesse contato com os desenvolvedores do kiR, para que a reformulação acontecesse mantendo os componentes-chave do programa.

Os esforços científicos da avaliação do PROERD que tem sido realizada nos últimos anos precisam ser levados em consideração na tomada de decisão sobre políticas públicas. As evidências, que trazem luz para as potencialidades e deficiências do programa, servem para nos ajudar a pensar sobre como melhorar o que já existe, garantindo uma melhora na educação e saúde públicas e validando o investimento público.

Este estudo avaliou apenas a implementação do programa em Escolas Estaduais do municípios de São Paulo, podendo não refletir a realidade de outras regiões do estado e de outros estados da federação. Além disso, destaca-se que o fato de termos excluído a

participação de escolas que já vinham aplicando o Proerd, nossa amostra de escolas não pode ser considerada representativa do município, mesmo que tenha havido sorteio para participação no ensaio controlado randomizado.

8. Referências Bibliográficas

1. Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, et al. Global burden of disease attributable to mental and substance use disorders : fi ndings from the Global Burden of Disease Study 2010. The Lancet. 2013;6736(13):1–12.

2. Malta DC, Mascarenhas MDM, Porto DL, Duarte EA, Sardinha LM, Barreto SM, et al. Prevalence of alcohol and drug consumption among adolescents : data analysis of the National Survey of School Health. Revista Brasileira de Epidemiologia. 2011;14(3).

3. Lopes GM, Arau B. Use of psychoactive substances by adolescents : current panorama. Revista Brasileira de Psiquiatria. 2013;35:51–61.

4. Chatterjee K, Dwivedi AK, Singh R. Age at first drink and severity of alcohol dependence. Med J Armed Forces India. 2021 Jan 1;77(1):70–4.

5. Hingson RW, Heeren T, Winter MR. Age at drinking onset and alcohol dependence: Age at onset, duration, and severity. Arch Pediatr Adolesc Med. 2006;160(7):739–46.

6. Sellers CM, McRoy RG, O'Brien KHMM. Substance use and suicidal ideation among child welfare involved adolescents: A longitudinal examination. Addictive Behaviors. 2019 Jun 1;93:39–45.

7. Sanchez ZM, Ribeiro KJ, Wagner GA. Binge drinking associations with patrons' risk behaviors and alcohol effects after leaving a nightclub: Sex differences in the "Balada com Ciência" portal survey study in Brazil. PLoS One. 2015 Aug 19;10(8).

8. Reis LF, Surkan PJ, Valente JY, Bertolla MHSM, Sanchez ZM. Factors associated with early sexual initiation and unsafe sex in adolescents: Substance use and parenting style. J Adolesc. 2020 Feb 1;79:128–35.

9. Pechansky F, Szobot CM, Scivoletto S. Alcohol use among adolescents: concepts, epidemiological characteristics and etiopatogenic factors. Revista Brasileira de Psiquiatria. 2004;26(I):14–7.

10. IBGE. Pesquisa Nacional de Saúde do Escolar. 2022.

11. Sloboda Z, Bukoski WJ. Handbook of Drug Abuse Prevention: Theory, Science and Practice. New York: Springer, 2006; 2006. 692 p.

12. Stockings E, Hall WD, Lynskey M, Morley KI, Reavley N, Strang J, et al. Prevention, early intervention, harm reduction, and treatment of substance use in young people. Lancet Psychiatry. 2016;3(3):280–96.

13. Sanchez ZM, Locatelli DP, Noto AR, Martins SS. Binge drinking among Brazilian students: A gradient of association with socioeconomic status in five geo-economic regions. Drug Alcohol Depend. 2013;127(1–3):87–93.

14. Jones SA, Nagel BJ, Lueras JM. Effects of Binge Drinking on the Developing Brain. Alcohol Res. 2018;39(1):87–96.

15. Kuntsche S, Kuntsche E. Parent-based interventions for preventing or reducing adolescent substance use - A systematic literature review. Vol. 45, Clinical Psychology Review. Elsevier Inc.; 2016. p. 89–101.

16. Conegundes L, Valente JY, Cogo-Moreira H, Martins CB, Andreoni S, Sanchez ZM. Transition from nonuse to use of alcohol or binge drinking among adolescents: Secondary analysis of a randomized controlled trial. Addictive Behaviors. 2020 Mar 1;102.

17. Chung T, Creswell KG, Bachrach R, Clark DB, Martin CS. Adolescent Binge Drinking Developmental Context and Opportunities for Prevention. Alcohol Res. 2018;39(1):5–15.

18. Lees B, Meredith LR, Kirkland AE, Bryant BE, Squeglia LM. Effect of alcohol use on the adolescent brain and behavior. Vol. 192, Pharmacology Biochemistry and Behavior. Elsevier Inc.; 2020.

19. Pérez-García JM, Suárez-Suárez S, Doallo S, Cadaveira F. Effects of binge drinking during adolescence and emerging adulthood on the brain: A systematic review of neuroimaging studies. Vol. 137, Neuroscience and Biobehavioral Reviews. Elsevier Ltd; 2022.

20. Danielson CK, De Arellano MA, Ehrenreich JT, Suárez LM, Bennett SM, Cheron DM, et al. Identification of high-risk behaviors among victimized adolescents and implications for empirically supported psychosocial treatment. J Psychiatr Pract. 2006;12(6):364–83.

21. Fleming LC, Jacobsen KH. Bullying among middle-school students in low and middle income countries. Health Promot Int. 2010;25(1):73–84.

22. Carbone-Lopez K, Esbensen FA, Brick BT. Correlates and consequences of peer victimization: Gender differences in direct and indirect forms of bullying. Youth Violence Juv Justice. 2010;8(4):332–50.

23. Cogo-Moreira H, Gusmões JD, Valente JY, Eid M, Sanchez ZM. Does #Tamojunto alter the dynamic between drug use and school violence among youth? Secondary analysis from a large cluster-randomized trial. Eur Child Adolesc Psychiatry. 2021;

24. Young R, Sweeting H, West P. A longitudinal study of alcohol use and antisocial behaviour in young people. Alcohol and Alcoholism. 2008;43(2):204–14.

25. Kelly AB, Chan GCK, Toumbourou JW, O'Flaherty M, Homel R, Patton GC, et al. Very young adolescents and alcohol: Evidence of a unique susceptibility to peer alcohol use. Addictive Behaviors. 2012 Apr;37(4):414–9.

26. Devries K, Knight L, Petzold M, Merrill KG, Maxwell L, Williams A, et al. Who perpetrates violence against children? A systematic analysis of age-specific and sex-specific data. BMJ Paediatr Open. 2018 Jan 1;2(1).

27. Eyng AM, Gisi ML, Ens RT. VIOLÊNCIAS NAS ESCOLAS E REPRESENTAÇÕES SOCIAIS : um diálogo necessário no cotidiano escolar título Violence in schools and social representations : 2009;467–80.

28. Moore SE, Norman RE, Suetani S, Thomas HJ, Sly PD, Scott JG. Consequences of bullying victimization in childhood and adolescence: A systematic review and meta-analysis. World J Psychiatry. 2017;7(1):60.

29. Katsaras GN, Vouloumanou EK, Kourlaba G, Kyritsi E, Evagelou E, Bakoula C. Bullying and Suicidality in Children and Adolescents Without Predisposing Factors: A Systematic Review and Meta-analysis. Vol. 3, Adolescent Research Review. Springer; 2018. p. 193–217.

30. Farrington D, Loeber R, Stallings R, Ttofi MM. Bullying perpetration and victimization as predictors of delinquency and depression in the Pittsburgh Youth Study. Journal of Aggression, … [Internet]. 2011;3(2):74–81. Available from: http://www.emeraldinsight.com/journals.htm?articleid=1927702&show=abstract

31. Malta DC, Souza ER De, Silva MMA Da, Silva CDS, Andreazzi MAR De, Crespo C, et al. Vivência de violência entre escolares brasileiros: resultados da Pesquisa Nacional de Saúde do Escolar (PeNSE). Cien Saude Colet. 2010;15:3053–63.

32. Mulla MM, Bogen KW, Orchowski LM. The mediating role of school connectedness in the associations between dating and sexual violence victimization and substance use among high school students. Vol. 139, Preventive Medicine. Academic Press Inc.; 2020.

33. Ttofi MM, Farrington DP, Losel F, Crago R v, Theodorakis N. School bullying and drug use later in life: A meta-analytic investigation. School Psychology Quarterly [Internet]. 2016;31(1):8–27. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=psyc11&AN=2015-15687-001%5Cnhttp://vq2st5lq8v.search.serialssolutions.com?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rfr_id=info:sid/Ovid:psyc11&rft.genre=article&rft_i

34. Reid RJ, Andrew Peterson N, Hughey J, Garcia-Reid P. School climate and adolescent drug use: Mediating effects of violence victimization in the urban high school context. Journal of Primary Prevention. 2006;27(3):281–92.

35. Fang L, Schiff M, Benbenishty R. Political violence exposure, adolescent school violence, and drug use: The mediating role of school support and posttraumatic stress. American Journal of Orthopsychiatry. 2016;86(6):662–70.

36. UNODC. International Standards on Drug Use Prevention. Viena; 2015.

37. Foxcroft DR, Tsertsvadze A. Universal family prevention programs for alcohol misuse in young people. Cochrane Database of Systematic Reviews. 2011;(5):CD009113.

38. Hanley S, Ringwalt C, Ennett ST, Vincus AA, Michael Bowling J, Haws SW, et al. The prevalence of evidence-based substance use prevention curricula in the nation's elementary schools 1. J Drug Educ. 2010;40(1):51–60.

39. Stephens PC, Sloboda Z, Stephens RC, Teasdale B, Grey SF, Hawthorne RD, et al. Universal school-based substance abuse prevention programs: Modeling targeted mediators and outcomes for adolescent cigarette, alcohol and marijuana use. Drug Alcohol Depend. 2009;102(1–3):19–29.

40. Strøm KK, Adolfsen F, Fossum S, Kaiser S, Martinussen M. Effectiveness of school-based preventive interventions on adolescent alcohol use: A meta-analysis of randomized controlled trials. Subst Abuse Treat Prev Policy. 2014;9(1):1–11.

41. Faggiano F, Vigna-Taglianti F, Versino E, Zambon A, Borraccino A, Lemma P. School-based prevention for illicit drugs' use. Cochrane Database of Systematic Reviews. 2005;(4).

42. Harrop E, Catalano RF. Evidence-Based Prevention for Adolescent Substance Use. Vol. 25, Child and Adolescent Psychiatric Clinics of North America. W.B. Saunders; 2016. p. 387–410.

43. Jackson C, Geddes R, Haw S, Frank J. Interventions to prevent substance use and risky sexual behaviour in young people: A systematic review. Addiction. 2012;107(4):733–47.

44. Werch CE, Owen DM. Iatrogenic effects of alcohol and drug prevention programs. J Stud Alcohol. 2002;63(5):581–90.

45. Lee NK, Cameron J, Battams S, Roche A. What works in school-based alcohol education: A systematic review. Health Educ J. 2016;75(7):780–98.

46. Sanchez ZM, Valente JY, Sanudo A, Pereira APD, Cruz JI, Schneider D, et al. The #Tamojunto Drug Prevention Program in Brazilian Schools: a Randomized Controlled Trial. Prevention Science. 2017;18(7):772–82.

47. Faggiano F, Galanti MR, Bohrn K, Burkhart G, Vigna-Taglianti F, Cuomo L, et al. The effectiveness of a school-based substance abuse prevention program: EU-Dap cluster randomised controlled trial. Prev Med (Baltim). 2008;47(5):537–43.

48. Sanchez ZM, Valente JY, Galvão PP, Gubert FA, Melo MHS, Caetano SC, et al. A cluster randomized controlled trial evaluating the effectiveness of the school-based drug prevention program #Tamojunto2.0. Addiction. 2021 Jun 1;116(6):1580–92.

49. Pentz MA. Evidence-Based Prevention: Characteristics, Impact, and Future Diretion. J Psychoactive Drugs. 2003;35:supl(April 2013):143–52.

50. UNODC - United Nations Office on Drugs and Crime, WHO - World Health Organization. International Standards on Drug Use Prevention Second updated edition. Viena; 2018.

51. da Silva FR, Assis SG. The prevention of violence in interdisciplinary programs implemented in Brazilian and Portuguese schools. Ciencia e Saude Coletiva. 2018 Sep 1;23(9):2899–908.

52. Thompkins A, Chauveron L, Harel O, Perkins D. Optimizing Violence Prevention Programs : An Examination of Program Effectiveness. Journal of School Health. 2014;84(7):435–43.

53. Bretherton D, Collins L, Ferretti C. Dealing with Conflict: Assessment of a Course for Secondary School Students. Aust Psychol. 1993;28(2):105–11.

54. Fagan AA, Catalano RF. What Works in Youth Violence Prevention: A Review of the Literature. Res Soc Work Pract. 2013;23(2):141–56.

55. Foshee VA, Bauman KE, Ennett ST, Suchindran C, Benefield T, Linder GF. Assessing the effects of the dating violence prevention program "safe dates" using random coefficient regression modeling. Prevention Science. 2005;6(3):245–58.

56. Bradshaw CP. Translating Research to Practice in Bullying Prevention.: @ Walden University Library. American Psychologist. 2015;70(4):322–32.

57. Cox E, Leung R, Baksheev G, Day A, Toumbourou JW, Miller P, et al. Violence Prevention and Intervention Programmes for Adolescents in Australia: A Systematic Review. Aust Psychol. 2016;51(3):206–22.

58. Mytton JA, DiGuiseppi C, Gough D, Taylor RS, Logan S. School-based secondary prevention programmes for preventing violence (Review). Cochrane Library. 2009;(4).

59. NIDA - NATIONAL INSTITUTE ON DRUG ABUSE. Preventing Drug Use Among Children and Adolescent: a research-based guide. Bethesda; 2003.

60. Botvin GJ, Griffin KW, Nichols TD. Preventing youth violence and delinquency through a universal school-based prevention approach. Prevention Science. 2006;7(4):403–8.

61. Hahn R, Fuqua-Whitley D, Wethington H, Lowy J, Crosby A, Fullilove M, et al. Effectiveness of Universal School-Based Programs to Prevent Violent and Aggressive Behavior. A Systematic Review. Am J Prev Med. 2007;33(2 SUPPL.).

62. Foshee VA, McNaughton Reyes HL, Ennett ST, Suchindran C, Mathias JP, Karriker-Jaffe KJ, et al. Risk and protective factors distinguishing profiles of adolescent peer and dating violence perpetration. Journal of Adolescent Health. 2011;48(4):344–50.

63. Steckler AB, Linnan L, Israel B. Process evaluation for public health interventions and research. San Francisco, CA: Jossey-Bass; 2002.

64. Flay BR, Biglan A, Boruch RF, Gonz F, Gottfredson D, Kellam S, et al. Standards of Evidence : Criteria for Efficacy , Effectiveness and Dissemination. 2005;6(3).

65. Beasley LO, Silovsky JF, Owora A, Burris L, Hecht D, DeMoraes-Huffine P, et al. Mixed-methods feasibility study on the cultural adaptation of a child abuse prevention model. Child Abuse Negl. 2014;38(9):1496–507.

66. Donabedian A. An introduction to quality assurance in health care. Oxford University Press; 2002.

67. Rohrbach LA, Dent CW, Skara S, Sun P, Sussman S. Fidelity of implementation in project towards no drug abuse (TND): A comparison of classroom teachers and program specialists. Prevention Science. 2007;8(2):125–32.

68. McDavid JC, Huse I, Hawthorn LR. Program evaluation and performance measurement: An introduction to practice. Sage Publications; 2018.

69. Moncher FJ, Prinz RJ. TREATMENT STUDIES IN OUTCOME. 1991;11:247–66.

70. Yeaton WH, Sechrest L. Critical Dimensions in the Choice and Maintenance of Successful Treatments : Strength , Integrity , and Effectiveness. 1981;49(2):156–67.

71. Lynch S, Donnell CO. The Evolving Definition , Measurement , and Conceptualization of Fidelity of Implementation in Scale-up of Highly Rated Science Curriculum Units in Diverse Middle Schools. 2005;(January).

72. Ruiz-Primo MA. A Multi-Method and Multi-Source Approach for Studying Fidelity of Implementation. Vol. 1522, CSE Report 677. 2006.

73. Keller-margulis MA. Fidelity of implementation framework: a critical need for response to intervention models. 2012;49(4):342–52.

74. Khoury CR, Mcintosh K, Hoselton R. An Investigation of Concurrent Validity of Fidelity of Implementation Measures at Initial Years of Implementation. 2019;40(1):23–31.

75. Broderick PC, Schussler DL. Exploring Fidelity in School-Based Mindfulness Programs. Glob Adv Health Med. 2021 Dec 12;10.

76. Evans RE, Moore G, Movsisyan A, Rehfuess E. How can we adapt complex population health interventions for new contexts? Progressing debates and research priorities. J Epidemiol Community Health (1978). 2021 Jan 1;75(1):40–5.

77. Pickard K, Mellman H, Frost K, Reaven J, Ingersoll B. Balancing Fidelity and Flexibility: Usual Care for Young Children With an Increased Likelihood of Having Autism Spectrum Disorder Within an Early Intervention System. J Autism Dev Disord. 2021;

78. Movsisyan A, Arnold L, Evans R, Hallingberg B, Moore G, O'Cathain A, et al. Adapting evidence-informed complex population health interventions for new contexts: A systematic review of guidance. Vol. 14, Implementation Science. BioMed Central Ltd.; 2019.

79. Castro FG, Barrera M, Martinez CR. The Cultural Adaptation of Prevention Interventions: Resolving Tensions Between Fidelity and Fit. Prevention Science. 2004;5(1):41–5.

80. Melo MH da S, Freitas I da S, Brandão LC, Gubert F do A, Rebouças LN, Sanchez Z van der M. Evaluation of the Implementation Process of the #Tamojunto2.0 Prevention Program in Brazilian Schools. School and Educational Psychology. 2022;32.

81. Century J, Rudnick M, Freeman C. A Framework for Measuring Fidelity of Implementation : A Foundation for Shared Language and Accumulation of Knowledge. 2010;199–218.

82. Dusenbury L, Brannigan R, Falco M, Hansen WB. A review of research on fidelity of implementation : implications for drug abuse prevention in school settings. 2003;18(2):237–56.

83. Medeiros PFP, Cruz JI, Schneider D, Sanudo A, Sanchez ZM. Process evaluation of the implementation of the Unplugged Program for drug use prevention in Brazilian schools. Subst Abuse Treat Prev Policy. 2016;11(1):1–11.

84. Shamblen SR, Courser MW, Abadi MH, Johnson KW, Young L, Browne TJ. An international evaluation of DARE in São Paulo, Brazil. Drugs: Education, Prevention and Policy. 2014;21(2):110–9.

85. Pan W, Bai H. A multivariate approach to a meta-analytic review of the effectiveness of the D.A.R.E. program. Int J Environ Res Public Health. 2009;6(1):267–77.

86. Lynam D, Milich R, Martin C, Logan TK, Zimmerman R, Novak SP, et al. Project DARE: No effects at 10-year follow-up. J Consult Clin Psychol. 1999;67(4):590–3.

87. Marsiglia FF, Hecht ML. Keepin'it REAL: An evidence-based program. Santa Cruz, CA: ETR Associates. 2005;

88. PROERD. Manual do Instrutor do 7º ano: Caindo na REAL / University of Arizona; PMMG; tradução coordenada por Bárbara G. J. Miranda. Belo Horizonte: PMMG; 2013.

89. PROERD. Currículo para crianças do 5º ano do ensino fundamental: Caindo na REAL / D.A.R.E. America; PMMG; tradução de Silas Tiago O. Melo e Soraya Érica Rodrigues Matoso. Belo Horizonte: PMMG; 2015.

90. PROERD. Currículo para crianças do 5º ano do ensino fundamental: Caindo na REAL / D.A.R.E. America. PMMG, editor. Belo Horizonte; 2015.

91. Hoffman DM. Reflecting on Social Emotional Learning: A Critical Perspective on Trends in the United States. Rev Educ Res. 2009;79(2):533–56.

92. Durlak JA, Weissberg RP, Dymnicki AB, Taylor RD, Schellinger KB. The Impact of Enhancing Students' Social and Emotional Learning: A Meta-Analysis of School-Based Universal Interventions. Child Dev. 2011;82(1):405–32.

93. Harthun ML, Dustman PA, Reeves LJ, Marsiglia FF, Hecht ML. Using Community-based Participatory Research to Adapt keepin' it REAL: Creating a Socially, Developmentally, and Academically Appropriate Prevention Curriculum for 5th Graders. J Alcohol Drug Educ. 2009;53(3):12–38.

94. Gosin M, Marsiglia FF, Hecht ML. keepin' it R.E.A.L. : A Drug Resistance Curriculum Tailored to the Strengths and Needs of Pre-Adolescents of the Southwest. J Drug Educ. 2003;33(2):119–42.

95. Spitzberg BH, Hecht ML. a Component Model of Relational Competence. Hum Commun Res. 1984;10(4):575–99.

96. Marsiglia FF, ZORITA P. Narratives as a Means to Support Latino/a Students in Higher Education. Reflections. 1996;2(1):54–62.

97. Cialdini RB, Reno RR, Kallgren CA. A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. J Pers Soc Psychol. 1990;58(6):1015–26.

98. Botvin GJ. Substance Abuse Prevention Research: Recent Developments and Future Directions. Journal of School Health. 1986;56(9):369–74.

99. Valente JY, Galvão PP de O, Gusmoes JDSP, Sanchez ZM. Revisão sistemática sobre o efeito do programa escolar de prevenção ao uso de drogas Keepin' it REAL: traduzido e implementado no Brasil pelo PROERD. Cien Saude Colet. 2022 Nov;27(11):4175–89.

100. Hecht ML, Marsiglia FF, Elek E, Wagstaff DA, Kulis S, Dustman P, et al. Culturally Grounded Substance Use Prevention: An Evaluation of the keepin' it R.E.A.L. Curriculum Michael. Prevention Science. 2003;4(4):233–48.

101. Kulis S, Nieri T, Yabiku S, Stromwall LK, Marsiglia FF. Promoting reduced and discontinued substance use among adolescent substance users: Effectiveness of a universal prevention program. Prevention Science. 2007;8(1):35–49.

102. Warren JR, Hecht ML, Wagstaff DA, Ndiaye K, Dustman P, Marsiglia FF. Journal of Applied Communication Communicating Prevention : The Effects of the keepin ' it REAL Classroom Videotapes and Televised PSAs on Middle-School Students ' Substance Use. 2007;(October 2014):37–41.

103. Kulis S, Yabiku ST, Marsiglia FF, Nieri T, Crossman A. DIFFERENCES BY GENDER, ETHNICITY, AND ACCULTURATION IN THE EFFICACY OF THE keepin' it REAL MODEL PREVENTION PROGRAM*. J Drug Educ. 2007;37(2):123–44.

104. Kulis SS, Ayers SL, Harthun ML. Substance Use Prevention for Urban American Indian Youth: A Efficacy Trial of the Culturally Adapted Living in 2 Worlds Program. Journal of Primary Prevention. 2017 Apr 1;38(1–2):137–58.

105. Marsiglia FF, Booth JM, Ayers SL, Nuño-Gutierrez BL, Kulis S, Hoffman S. Short-Term Effects on Substance Use of the Keepin' It REAL Pilot Prevention

Program: Linguistically Adapted for Youth in Jalisco, Mexico. Prevention Science. 2014 Oct 1;15(5):694–704.

106. Hecht ML. Designed Cultural Adaptation and Delivery Quality in Rural Substance Use Prevention : an Effectiveness Trial for the Keepin ' it REAL Curriculum. 2018;(2016).

107. Kulis SS, Marsiglia FF, Porta M, Arévalo Avalos MR, Ayers SL. Testing the keepin' it REAL Substance Use Prevention Curriculum Among Early Adolescents in Guatemala City. Prevention Science. 2019 May 15;20(4):532–43.

108. Kulis S, Marsiglia FF, Elek E, Dustman P, Wagstaff DA, Hecht ML. Mexican/Mexican American Adolescents and keepin' it REAL: An Evidence-Based Substance Use Prevention Program. Child Sch. 2005 Jul;27(3):133–45.

109. Marsiglia FF, Kulis SS, Booth JM, Nuño-Gutierrez BL, Robbins DE. Long-Term Effects of the keepin' it REAL Model Program in Mexico: Substance Use Trajectories of Guadalajara Middle School Students. Journal of Primary Prevention. 2015 Apr 1;36(2):93–104.

110. Hecht ML, Shin YJ, Pettigrew J, Miller-Day M, Krieger JL. Designed Cultural Adaptation and Delivery Quality in Rural Substance Use Prevention: an Effectiveness Trial for the Keepin' it REAL Curriculum. Prevention Science. 2018 Nov 1;19(8):1008–18.

111. Kulis SS, Garcia-Perez H, Marsiglia FF, Ayers SL. Testing a Culturally Adapted Youth Substance Use Prevention Program in a Mexican Border City: Mantente REAL. Subst Use Misuse. 2020;56(2):245–57.

112. Elek E, Wagstaff DA, Hecht ML. Effects of the 5th and 7th grade enhanced versions of the keepin' it real substance use prevention curriculum. J Drug Educ. 2010 Jan 1;40(1):61–79.

113. Marsiglia FF, Kulis S, Yabiku ST, Nieri TA, Coleman E. When to Intervene: Elementary School, Middle School or Both? Effects of keepin' It REAL on Substance Use Trajectories of Mexican Heritage Youth. Prevention Science. 2011 Mar 1;12(1):48–62.

114. Marsiglia FF, Kulis S, Yabiku ST, Nieri TA, Coleman E. When to Intervene : Elementary School , Middle School or Both ? Effects of keepin ' It REAL on Substance Use Trajectories of Mexican Heritage Youth. 2011;48–62.

115. Kulis S, Marsiglia FF, Elek E, Dustman P, Wagstaff DA, Hecht ML. Mexican/Mexican American Adolescents and keepin' it REAL: An Evidence-Based Substance Use Prevention Program. Child Sch. 2005;25(3):133–45.

116. Kulis SS, Marsiglia FF, Medina-Mora ME, Nuño-Gutiérrez BL, Corona MD, Ayers SL. Keepin' It REAL—Mantente REAL in Mexico: a Cluster Randomized Controlled Trial of a Culturally Adapted Substance Use Prevention Curriculum for Early Adolescents. Prevention Science. 2021 Jul 1;22(5):645–57.

117. Kulis S, Marsiglia FF, Elek E, Wagstaff DA, Hecht ML. Mexican/Mexican American Adolescents and keepin' it REAL: An Evidence-Based Substance Use Prevention Program. Vol. 27, Child Sch. 2005.

118. Hecht ML, Elek E, Wagstaff DA, Kam JA, Marsiglia F, Dustman P, et al. Immediate and short-term effects of the 5th grade version of the keepin' it real substance use prevention intervention. J Drug Educ. 2008;38(3):225–51.

119. Hecht ML, Elek E, Wagstaff DA, Kam JA, Marsiglia F, Dustman P, et al. IMMEDIATE AND SHORT-TERM EFFECTS OF THE 5 TH GRADE VERSION OF THE keepin ' it REAL SUBSTANCE USE PREVENTION INTERVENTION *. 2008;38(3):225–51.

120. Sanchez ZM, Valente JY, Gusmões JDP, Ferreira-Junior V, Caetano SC, Cogo-Moreira H, et al. Effectiveness of a school-based substance use prevention program taught by police officers in Brazil: Two cluster randomized controlled trials of the PROERD. International Journal of Drug Policy [Internet]. 2021;98:103413. Available from: https://doi.org/10.1016/j.drugpo.2021.103413

121. Valente JY, Sanchez ZM. Short - Term Secondary Effects of a School - Based Drug Prevention Program : Cluster - Randomized Controlled Trial of the Brazilian Version of DARE ' s Keepin ' it REAL. Prevention Science [Internet]. 2021;(0123456789). Available from: https://doi.org/10.1007/s11121-021-01277-w

122. Valente JY, Sanchez ZM. Mediating Factors of a Brazilian School-Based Drug Prevention Program. Int J Ment Health Addict. 2022;

123. Creswell JW, Creswell JD. Research design: Qualitative, quantitative, and mixed methods approaches. 3 ed. EUA: Sage Publications; 2009.

124. Patton MQ. Qualitative research. Wiley Online Library; 2005.

125. Minayo MC de S, Deslandes SF, Gomes RC. Pesquisa social: teoria, método e criatividade. Pesquisa social: teoria, método e criatividade. 2015;

126. Donner A, Klar N. Design and analysis of cluster randomized trials in health research. Stat Med. 2000;22(1):329–496.

127. Guilheri J, Cogo-Moreira H, Kubiszewski V, Yazigi L, Andronikof A. Bullying in school: Construct validity of the French version of the Olweus revised Bully/victim Questionnaire (rBVQ). Neuropsychiatr Enfance Adolesc. 2015 Jun 1;63(4):211–7.

128. Sanchez ZM, Sanudo A, Andreoni S, Schneider D, Pereira APD, Faggiano F. Efficacy evaluation of the school program Unplugged for drug use prevention among Brazilian adolescents. BMC Public Health. 2016;16(1):1–9.

129. Ahn C, Heo M, Zhang S. Sample size calculations for clustered and longitudinal outcomes in clinical research. CRC Press; 2014.

130. Sanchez ZM, Valente JY, Sanudo A, Pereira APD, Cruz JI, Schneider D, et al. The #Tamojunto Drug Prevention Program in Brazilian Schools: a Randomized Controlled Trial. Prevention Science. 2017 Oct;18(7):772–82.

131. Levenshtein VI. Binary codes capable of correcting deletions, insertions and reversals. Dokl Akad Nauk SSSR. 1965;10(8):845–8.

132. Medeiros PFP, Cruz JI, Schneider D, Sanudo A, Sanchez ZM. Process evaluation of the implementation of the Unplugged Program for drug use prevention in Brazilian schools. Subst Abuse Treat Prev Policy. 2016 Jan 7;11(1).

133. Prado MCDO, Schneider DR, Sañudo A, Pereira APD, Horr JF, Sanchez ZM. Transcultural adaptation of questionnaire to evaluate drug use among students: The use of the EU-dap european questionnaire in Brazil. Subst Use Misuse. 2016;51(4):449–58.

134. CEBRID - Centro Brasileiro de Informações sobre Drogas Psicotrópicas. VI Levantamento Nacional sobre o Consumo de Drogas Psicotrópicas entre Estudantes do Ensino Fundamental e Médio das Redes Pública e Privada de Ensino nas 27 Capitais Brasileiras. 2010.

135. IBGE - Instituto Brasileiro de Geografia e Estatística. Pesquisa Nacional de Saúde do Escolar2011. Rio de Janeiro; 2012.

136. Galanti MR, Siliquini R, Cuomo L, Melero JC, Panella M, Faggiano F. Testing anonymous link procedures for follow-up of adolescents in a school-based trial: The EU-DAP pilot study. Prev Med (Baltim). 2007;44(2):174–7.

137. Beroho M, Briak H, el Halimi R, Ouallali A, Boulahfa I, Mrabet R, et al. Analysis and prediction of climate forecasts in Northern Morocco: application of multilevel linear mixed effects models using R software. Heliyon. 2020 Oct 1;6(10).

138. Who - World Health Organization. Qualitative research for health programmes. 1994. p. 99.

139. Patton MQ. Qualitative research and evaluation methods. 3rd Editio. Thousand Oaks: Sage Publications; 2002.

140. Fereday J, Muir-Cochrane E. Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. Int J Qual Methods. 2006;5(1).

141. Strauss A, Corbin J. Bases de la investigación cualitativa - técnicas y procedimientos para desarrollar la teoría fundamentada. 2012.

142. Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, et al. Global burden of disease attributable to mental and substance use disorders: Findings from the Global Burden of Disease Study 2010. The Lancet. 2013;382(9904):1575–86.

143. Gosin M, Francisco Marsiglia F, Hecht ML. keepin' it R.E.A.L.: A DRUG RESISTANCE CURRICULUM TAILORED TO THE STRENGTHS AND

NEEDS OF PRE-ADOLESCENTS OF THE SOUTHWEST. Vol. 33, J. DRUG EDUCATION. 2003.

144. Michael L. Hecht, Flavio Francisco Marsiglia, Elvira Elek, David A. Wagstaff, Stephen Kulis, Patricia Dustman, et al. Culturally Grounded Substance Use Prevention: An Evaluationof thekeepin' it R.E.A.L.Curriculum. Prevention Science. 2003;4(4):233–48.

145. Kulis SS, Marsiglia FF, Medina-Mora ME, Nuño-Gutiérrez BL, Corona MD, Ayers SL. Keepin' It REAL—Mantente REAL in Mexico: a Cluster Randomized Controlled Trial of a Culturally Adapted Substance Use Prevention Curriculum for Early Adolescents. Prevention Science. 2021 Jul 1;22(5):645–57.

146. Kulis SS, Marsiglia FF, Porta M, Arévalo Avalos MR, Ayers SL. Testing the keepin' it REAL Substance Use Prevention Curriculum Among Early Adolescents in Guatemala City. Prevention Science. 2019 May 15;20(4):532–43.

147. Cutrín O, Kulis S, Maneiro L, MacFadden I, Navas MP, Alarcón D, et al. Effectiveness of the Mantente REAL Program for Preventing Alcohol Use in Spanish Adolescents. Psychosocial Intervention. 2021 Sep 1;30(3):113–22.

148. Hecht ML, Shin YJ, Pettigrew J, Miller-Day M, Krieger JL. Designed Cultural Adaptation and Delivery Quality in Rural Substance Use Prevention: an Effectiveness Trial for the Keepin' it REAL Curriculum. Prevention Science. 2018 Nov 1;19(8):1008–18.

149. Elek E, Wagstaff DA, Hecht ML. Effects of the 5th and 7th grade enhanced versions of the keepin' it real substance use prevention curriculum. J Drug Educ. 2010 Jan 1;40(1):61–79.

150. Marsiglia FF, Kulis S, Yabiku ST, Nieri TA, Coleman E. When to Intervene: Elementary School, Middle School or Both? Effects of keepin' It REAL on Substance Use Trajectories of Mexican Heritage Youth. Prevention Science. 2011 Mar 1;12(1):48–62.

151. Pereira APD, Sanchez ZM. Characteristics of school-based drug prevention programs in Brazil. Ciencia e Saude Coletiva. 2020 Aug 1;25(8):3131–42.

152. Sanchez ZM, Valente JY, Gusmões JDP, Ferreira-Junior V, Caetano SC, Cogo-Moreira H, et al. Effectiveness of a school-based substance use prevention program taught by police officers in Brazil: Two cluster randomized controlled trials of the PROERD. International Journal of Drug Policy. 2021 Dec 1;98.

153. Valente JY, Galvão PP de O, Gusmoes JDSP, Sanchez ZM. Revisão sistemática sobre o efeito do programa escolar de prevenção ao uso de drogas Keepin' it REAL: traduzido e implementado no Brasil pelo PROERD. Cien Saude Colet. 2022 Nov;27(11):4175–89.

154. Gusmoes JD, Garcia-Cerde R, Valente JY, Pinsky I, Sanchez ZM. Implementation fidelity of a Brazilian drug use prevention program and its effect among adolescents: a mixed-methods study. Subst Abuse Treat Prev Policy. 2022 Dec 1;17(1).

155. Hill HC, Erickson A. Using Implementation Fidelity to Aid in Interpreting Program Impacts: A Brief Review. Educational Researcher. 2019 Dec 1;48(9):590–8.

156. Evans RE, Moore G, Movsisyan A, Rehfuess E. How can we adapt complex population health interventions for new contexts? Progressing debates and research priorities. J Epidemiol Community Health (1978). 2021 Jan 1;75(1):40–5.

157. Griner D, Smith TB. Culturally adapted mental health intervention: A meta-analytic review. Special issue: Culture, race, and ethnicity in psychotherapy. Vol. 43, Psychotherapy. 2006. p. 531–48.

158. Miller-Day M, Pettigrew J, Hecht ML, Shin YJ, Graham J, Krieger J. How prevention curricula are taught under real-world conditions: Types of and reasons for teacher curriculum adaptations. Health Educ. 2013 Jun;113(4):324–44.

159. Miller-Day M, Hecht ML. Narrative Means to Preventative Ends: A Narrative Engagement Framework for Designing Prevention Interventions. Health Commun. 2013 Oct;28(7):657–70.

160. Hecht ML, Krieger JLR. The principle of cultural grounding in school-based substance abuse prevention: The drug resistance strategies project. J Lang Soc Psychol. 2006 Sep;25(3):301–19.

161. Botvin GJ. Substance Abuse Prevention Research: Recent Developments and Future Directions. Journal of School Health. 1986;56(9):369–74.

162. Patton MQ. Qualitative research and evaluation methods. Thousand Oaks. Cal.: Sage Publications; 2002.

163. OECD. Education in Brazil: An International Perspective. Paris; 2021.

164. Nobre GC, Valentini NC, Nobre FSS. Fundamental motor skills, nutritional status, perceived competence, and school performance of Brazilian children in social vulnerability: Gender comparison. Child Abuse Negl. 2018 Jun 1;80:335–45.

165. Chakraborti-Ghosh S, Orellana KM, Jones J. A CROSS-CULTURAL COMPARISON OF TEACHERS' PERSPECTIVES ON INCLUSIVE EDUCATION THROUGH A STUDY ABROAD PROGRAM IN BRAZIL AND IN THE US [Internet]. Vol. 29, INTERNATIONAL JOURNAL OF SPECIAL EDUCATION. 2014. Available from: www.youtube.com/watch?v=VrOvE0eaF-0

166. Skaalvik EM, Skaalvik S. Still motivated to teach? A study of school context variables, stress and job satisfaction among teachers in senior high school. Social Psychology of Education. 2017 Mar 1;20(1):15–37.

167. Ijadi-Maghsoodi R, Marlotte L, Garcia E, Aralis H, Lester P, Escudero P, et al. Adapting and Implementing a School-Based Resilience-Building Curriculum

Among Low-Income Racial and Ethnic Minority Students. Contemp Sch Psychol. 2017 Sep;21(3):223–39.

168. Caldwell LL, Smith EA, Collins LM, Graham JW, Lai M, Wegner L, et al. Translational Research in South Africa: Evaluating Implementation Quality Using a Factorial Design. Child Youth Care Forum. 2012 Apr;41(2):119–36.

169. Dusenbury L, Hansen WB, Jackson-Newsom J, Pittman DS, Wilson C v., Nelson-Simley K, et al. Coaching to enhance quality of implementation in prevention. Health Educ. 2010 Jan 1;110(1):43–60.

170. Downer JT, Locasale-Crouch J, Hamre B, Pianta R. Teacher characteristics associated with responsiveness and exposure to consultation and online professional development resources. Early Educ Dev. 2009;20(3):431–55.

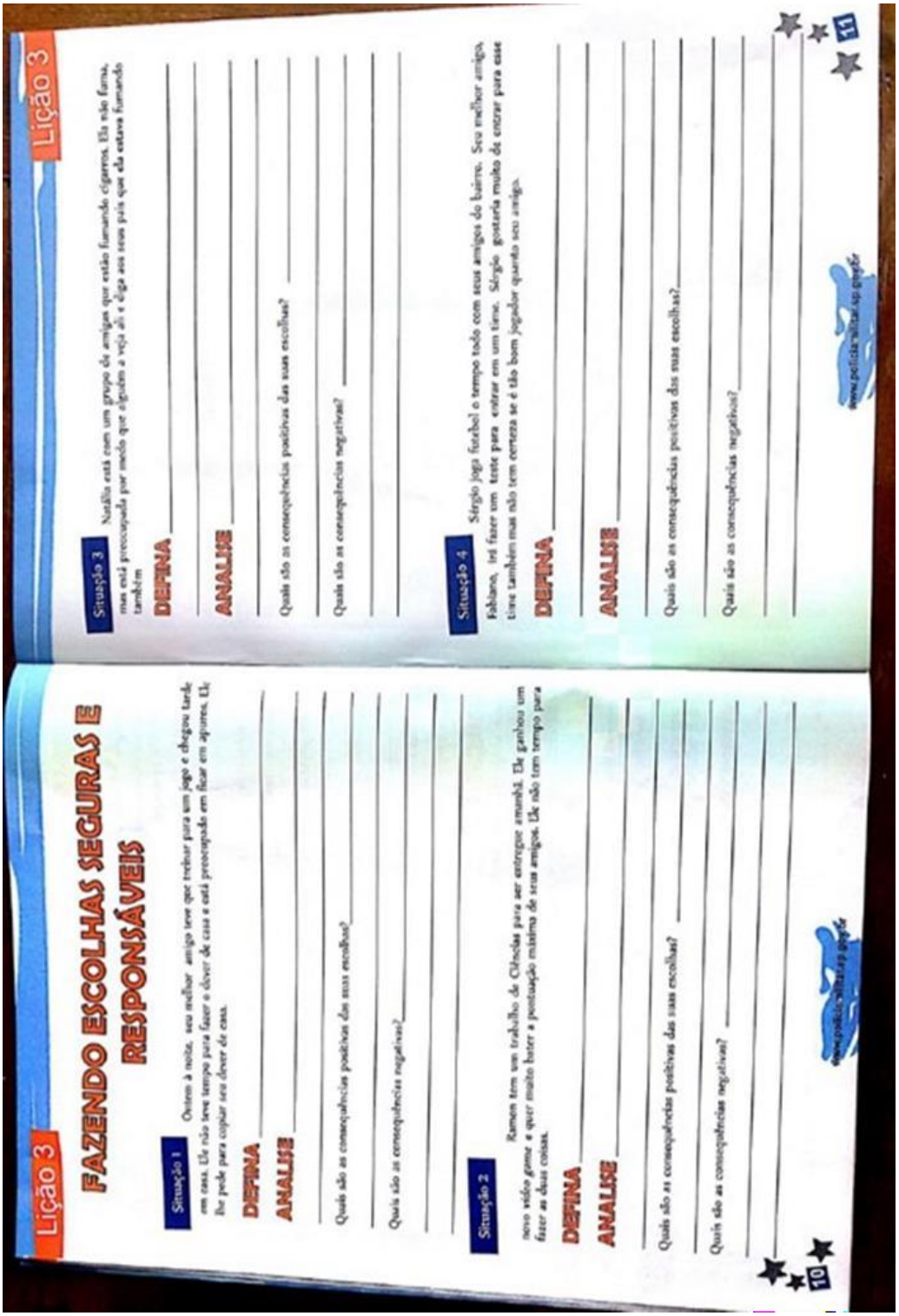
171. Collins LM, Baker TB, Mermelstein RJ, Piper ME, Jorenby DE, Smith SS, et al. The multiphase optimization strategy for engineering effective tobacco use interventions. In: Annals of Behavioral Medicine. 2011. p. 208–26.

172. Daniel JZ, Hickman M, Macleod J, Wiles N, Lingford-Hughes A, Farrell M, et al. Is socioeconomic status in early life associated with drug use? A systematic review of the evidence. Drug Alcohol Rev. 2009 Mar;28(2):142–53.

173. Dusenbury L, Brannigan R, Falco M, Hansen WB. A review of research on fidelity of implementation: implications for drug abuse prevention in school settings laborate to develop ways of introducing flexibil-ity into prevention programs [Internet]. Vol. 18, HEALTH EDUCATION RESEARCH. 2003. Available from: http://her.oxfordjournals.org/

ANEXOS

Anexo 1: Exemplos de atividades – Lição 3 do 5º ano e Lição 7 do 7º ano



Lição 3

FAZENDO ESCOLHAS SEGURAS E RESPONSÁVEIS

Situação 1 Ontem à noite, seu melhor amigo teve que treinar para um jogo e chegou tarde em casa. Ele não teve tempo para fazer o dever de casa e está preocupado em ficar em apuros. Ele lhe pede para copiar seu dever de casa.

DEFINA _____

ANALISE _____

Quais são as consequências positivas dos seus escolhas? _____

Quais são as consequências negativas? _____

Situação 2 Ramon tem um trabalho de Ciências para ser entregue amanhã. Ele ganhou um novo vídeo game e quer muito bater a pontuação máxima de seus amigos. Ele não tem tempo para fazer as duas coisas.

DEFINA _____

ANALISE _____

Quais são as consequências positivas das suas escolhas? _____

Quais são as consequências negativas? _____

10

Lição 3

Situação 3 Natália está com um grupo de amigas que estão fumando cigarros. Ela não fuma, mas está preocupada por medo que alguém a veja ali e diga aos seus pais que ela estava fumando também.

DEFINA _____

ANALISE _____

Quais são as consequências positivas das suas escolhas? _____

Quais são as consequências negativas? _____

Situação 4 Sérgio joga futebol o tempo todo com seus amigos do bairro. Seu melhor amigo, Fabiano, irá fazer um teste para entrar em um time. Sérgio gostaria muito de entrar para esse time também mas não tem certeza se é tão bom jogador quando seu amigo.

DEFINA _____

ANALISE _____

Quais são as consequências positivas das suas escolhas? _____

Quais são as consequências negativas? _____

11

CENÁRIOS de

Lição 7

Orientações: Primeiramente decida quem está interpretando que papel e o que está acontecendo. Em seguida, decida como cada apresentação terminará. Durante a encenação, certifique-se de que alguém fará uma oferta e alguém resistirá à oferta usando uma estratégia REAL. A idéia é resistir à oferta Recusando, Explicando, Abstendo-se e então Livrando-se. Esteja preparado para seu instrutor pedir para que parem dizendo "congele", e quando isso acontecer você dará uma pausa na encenação e deixará o restante da classe perguntar ou fazer comentários.

Cenário A

Seu grupo está na casa de um amigo de quem os pais não estão em casa. Enquanto você anda pela casa, algumas pessoas abrem a geladeira e encontram algumas cervejas. Eles começam a distribuir cervejas para o resto do grupo. E aí, o que acontece?

Cenário B

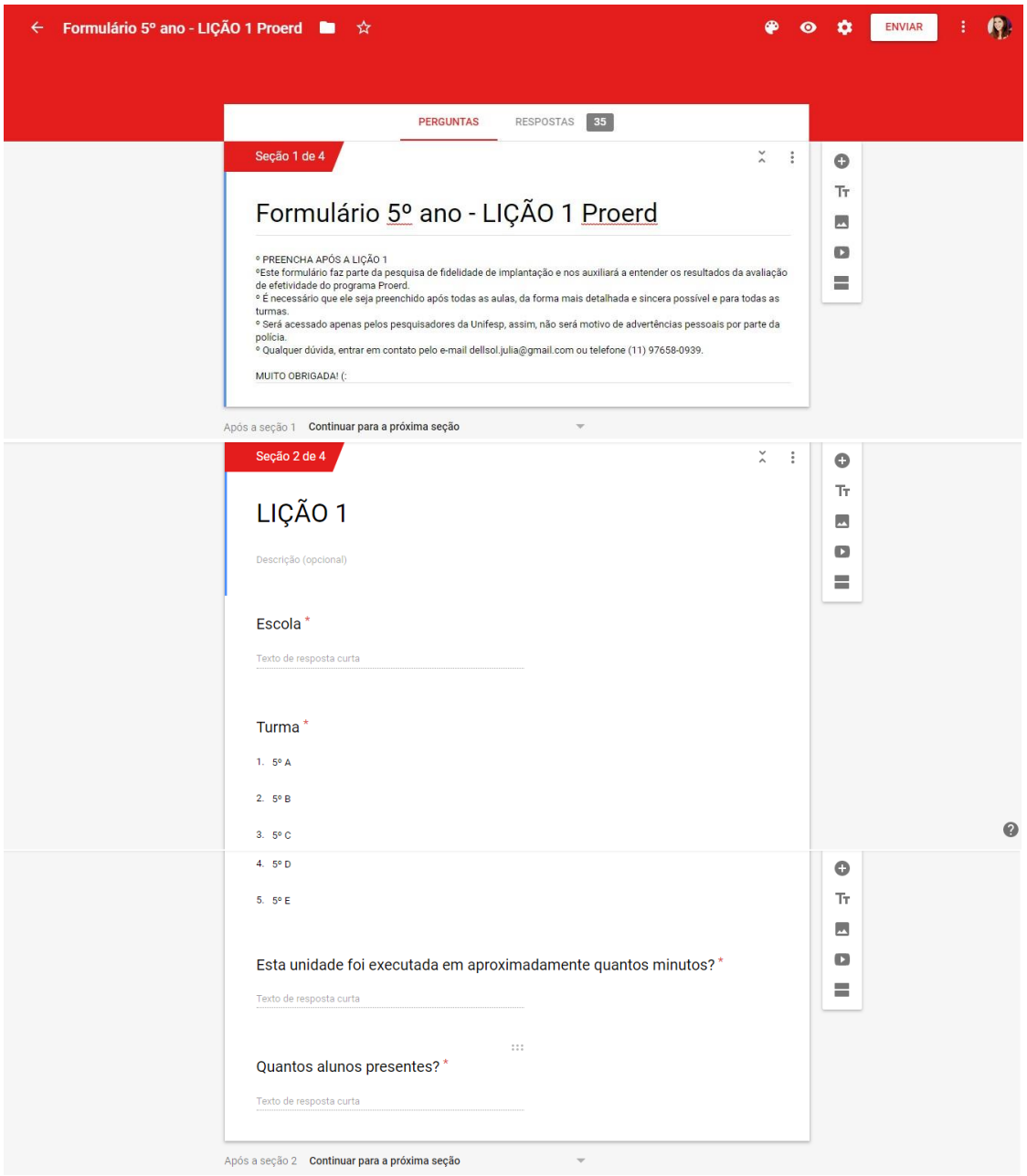
Você e seu grupo estão passeando pelo parque. Uma das pessoas do grupo tira uns cigarros e várias pessoas os acendem. Há cigarros suficientes para todo mundo e eles começam a ser distribuídos a todos. E aí, o que acontece?

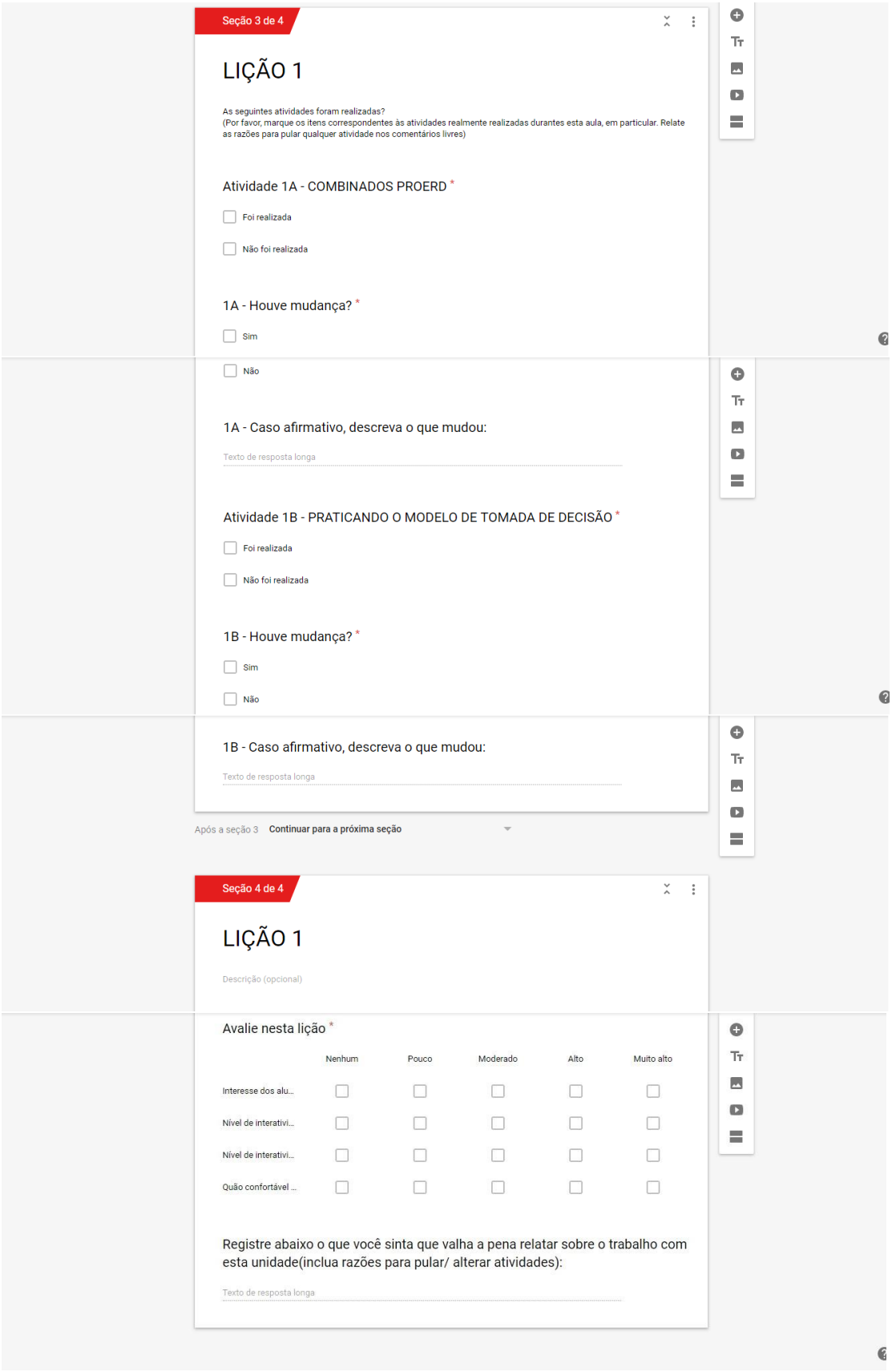
Cenário C

Você está em um estacionamento depois de um jogo de basquete com seu grupo de amigos quando alguns estudantes mais velhos aparecem. Eles oferecem a você e a seus amigos cervejas. E aí, o que acontece?

Anexo 2

Formulário aula a aula – Lição 1 do 5º ano (os formulários para as outras 9 lições do 5º ano e as 10 lições do 7º ano seguem o mesmo padrão, mudando apenas os nomes das atividades referentes às mesmas).





Seção 3 de 4

LIÇÃO 1

As seguintes atividades foram realizadas?
(Por favor, marque os itens correspondentes às atividades realmente realizadas durantes esta aula, em particular. Relate as razões para pular qualquer atividade nos comentários livres)

Atividade 1A - COMBINADOS PROERD *

- [ ] Foi realizada
- [ ] Não foi realizada

1A - Houve mudança? *

- [ ] Sim
- [ ] Não

1A - Caso afirmativo, descreva o que mudou:

Texto de resposta longa

Atividade 1B - PRATICANDO O MODELO DE TOMADA DE DECISÃO *

- [ ] Foi realizada
- [ ] Não foi realizada

1B - Houve mudança? *

- [ ] Sim
- [ ] Não

1B - Caso afirmativo, descreva o que mudou:

Texto de resposta longa

Após a seção 3 Continuar para a próxima seção

Seção 4 de 4

LIÇÃO 1

Descrição (opcional)

Avalie nesta lição *

	Nenhum	Pouco	Moderado	Alto	Muito alto
Interesse dos alu...	☐	☐	☐	☐	☐
Nível de interativi...	☐	☐	☐	☐	☐
Nível de interativi...	☐	☐	☐	☐	☐
Quão confortável ...	☐	☐	☐	☐	☐

Registre abaixo o que você sinta que valha a pena relatar sobre o trabalho com esta unidade(inclua razões para pular/ alterar atividades):

Texto de resposta longa

Anexo 3: Questionários do 5º e do 7º ano

PRE 5o ANO

G1 - Página 1

x1 - COD ACESSO

Resposta:

x2 - COD ANONIMATO

Resposta:

1 - VOCÊ É MENINO OU MENINA?

2 - DE QUE COR VOCÊ É?

3 - QUANTOS ANOS VOCÊ TEM?

Resposta:

4 - VOCÊ GOSTA DA SUA ESCOLA?

5 - COMO FORAM SUAS NOTAS NA ESCOLA NO ANO PASSADO?

6 - NA SUA VIDA VOCÊ JÁ EXPERIMENTOU ALGUMA BEBIDA ALCOÓLICA, OU SEJA, QUE TENHA ÁLCOOL? POR EXEMPLO: Cerveja, Chopp, Vodka, Vinho, Ice, Pinga, Batidas)

7 - QUANTOS ANOS VOCÊ TINHA QUANDO EXPERIMENTOU BEBIDA ALCOÓLICA PELA PRIMEIRA VEZ?

Resposta:

8 - NO ANO PASSADO, VOCÊ TOMOU ALGUMA BEBIDA ALCOÓLICA?

9 - NO MÊS PASSADO VOCÊ TOMOU ALGUMA BEBIDA ACOÓLICA?

10 - VOCÊ JÁ FICOU BÊBADO ALGUMA VEZ NA VIDA?

11 - QUANTAS VEZES NA VIDA VOCÊ JÁ FICOU BÊBADO?

Resposta:

12 - EM UMA ÚNICA OCASIÃO, COMO EM UMA FESTA QUE VOCÊ FOI, VOCÊ JÁ CHEGOU A BEBER 5 COPOS OU LATAS DE BEBIDAS ALCOÓLICAS?

13 - ISSO DE BEBER 5 COPOS OU LATAS DE BEBIDAS ALCOÓLICAS EM UMA ÚNICA OCASIÃO ACONTECEU COM VOCÊ NO ANO PASSADO?

14 - ISSO DE BEBER 5 COPOS OU LATAS DE BEBIDAS ALCOÓLICAS EM UMA ÚNICA OCASIÃO ACONTECEU COM

VOCÊ NO MÊS PASSADO?

15 - VOCÊ JÁ FUMOU CIGARRO ALGUMA VEZ NA SUA VIDA?

16 - E NO ANO PASSADO, VOCÊ FUMOU ALGUM CIGARRO?

17 - E NO MÊS PASSADO, VOCÊ FUMOU ALGUM CIGARRO?

18 - VOCÊ JÁ EXPERIMENTOU MACONHA?

19 - ANO PASSADO, VOCÊ USOU MACONHA?

20 - MÊS PASSADO, VOCÊ USOU MACONHA?

21 - VOCÊ JÁ EXPERIMENTOU HOLOTEN OU CARPINOL?

22 - QUANDO ESTIVER PRONTO, CLIQUE EM SEGUE

23 - ENTÃO VAMOS LÁ!NO ANO QUE VEM, VOCÊ ACHA QUE VAI FUMAR CIGARROS?

24 - NO ANO QUE VEM, VOCÊ ACHA QUE VAI BEBER BEBIDAS ALCOÓLICAS?

25 - NO ANO QUE VEM, VOCÊ ACHA QUE VAI FICAR BÊBADO?

26 - NO ANO QUE VEM, VOCÊ ACHA QUE VAI FUMAR MACONHA?

27 - AGORA VAMOS PERGUNTAR SOBRE ALGUMAS SITUAÇÕES QUE PODEM OU NÃO TER ACONTECIDO EM SUA ESCOLA

28 - RECENTEMENTE, ALGUM ALUNO TE XINGOU, TE ZOOU OU FEZ BRINCADEIRA DE MAU GOSTO COM VOCÊ?

29 - ESSES XINGAMENTOS, ZOAÇÕES E BRINCADEIRAS DE MAU GOSTO, ACONTECIAM NO ANO PASSADO?

30 - RECENTEMENTE, ALGUM ALUNO TE DEIXOU SOZINHO, DE FORA DE ATIVIDADES E BRINCADEIRAS OU TE IGNOROU DE PROPÓSITO?

31 - ISSO DE SER DEIXADO SOZINHO OU SER IGNORADO, ACONTECIA NO ANO PASSADO?

32 - RECENTEMENTE, ALGUM ALUNOU TE BATEU, DEU MURROS OU CHUTES?

33 - ISSO DE TE CHUTAREM OU DE TE MACHUCAREM ACONTECIA NO ANO PASSADO?

34 - RECENTEMENTE, ALGUM ALUNO DISSE MENTIRAS OU FEZ FOFOCAS PARA TENTAR FAZER OS OUTROS NÃO GOSTAREM DE VOCÊ?

35 - ISSO DE FALARAM MENTIRAS SOBRE VOCÊ ACONTECEU NO ANO PASSADO?

36 - RECENTEMENTE, ALGUM ALUNO PEGOU ALGUMA COISA SUA SEM PERMISSÃO OU ESTRAGOU ALGO SEU

DE PROPÓSITO?

37 - ISSO DE PEGAR OU ESTRAGAR COISAS SUAS ACONTECEU COM VOCÊ NO ANO PASSADO?

38 - RECENTEMENTE, ALGUM ALUNO TE AMEAÇOU, OU FORÇOU VOCÊ A FAZER COISAS QUE VOCÊ NÃO QUERIA?

39 - ISSO DE TE FORÇAR A FAZER COISAS QUE VOCÊ NÃO QUERIA, ACONTECEU COM VOCÊ NO ANO PASSADO?

40 - RECENTEMENTE, ALGUM ALUNO TE XINGOU, ZOOU OU TE OFENDEU POR CAUSA DA COR DA SUA PELE?

41 - ESSAS ZOAÇÕES E XINGAMENTOS POR CAUSA DA COR DA SUA PELE ACONTECIAM NO ANO PASSADO?

42 - RECENTEMENTE, VOCÊ XINGOU, ZOOU OU FEZ BRINCADEIRA DE MAU GOSTO COM ALGUÉM DE SUA ESCOLA?

43 - NO ANO PASSADO, VOCÊ FAZIA ISTO, DE XINGAR, ZOAR OU FAZER BRINCADEIRA DE MAU GOSTO COM ALGUÉM DE SUA ESCOLA?

44 - RECENTEMENTE, VOCÊ IGNOROU ALGUM COLEGA OU DEIXOU ELE OU ELA SOZINHO, DE FORA DE ATIVIDADES E BRINCADEIRAS DE PROPÓSITO?

45 - NO ANO PASSADO, VOCÊ FAZIA ISSO, DE IGNORAR ALGUM COLEGA OU DE DEIXAR ELE OU ELA DE FORA DE ATIVIDADES E BRINCADEIRAS DE PROPÓSITO?

46 - RECENTEMENTE, VOCÊ BATEU, DEU MURROS OU CHUTES EM ALGUM ALUNO DA ESCOLA?

47 - NO ANO PASSADO, VOCÊ FAZIA ISSO, DE BATER, DAR MURROS OU CHUTES EM ALGUM ALUNO DA ESCOLA?

48 - RECENTEMENTE, VOCÊ DISSE MENTIRAS OU FEZ FOFOCAS PARA TENTAR FAZER OS OUTROS NÃO GOSTAREM DE ALGUM COLEGA DA ESCOLA?

49 - NO ANO PASSADO, VOCÊ FAZIA ISSO, DE DIZER MENTIRAS OU FAZER FOFOCAS PARA TENTAR FAZER OS OUTROS NÃO GOSTAREM DE ALGUM COLEGA DA ESCOLA?

50 - RECENTEMENTE, VOCÊ PEGOU ALGUMA COISA SEM A PERMISSÃO DE ALGUM COLEGA OU ESTRAGOU DE PROPÓSITO?

51 - NO ANO PASSADO, VOCÊ FEZ ISSO, DE PEGAR ALGUMA COISA SEM A PERMISSÃO DE ALGUM COLEGA OU DE ESTRAGAR ALGO DE PROPÓSITO?

52 - RECENTEMENTE, VOCÊ AMEAÇOU, OU FORÇOU ALGUM ALUNO A FAZER COISAS QUE ELE OU ELA NÃO QUERIA?

53 - NO ANO PASSADO, VOCÊ FEZ ISSO, DE AMEAÇAR, OU FORÇAR ALGUM ALUNO A FAZER COISAS QUE ELE OU ELA NÃO QUERIA?

54 - RECENTEMENTE, VOCÊ XINGOU, ZOOU OU OFENDEU ALGUM ALUNO POR CAUSA DA COR DA PELE DELE

OU DELA?

55 - NO ANO PASSADO, VOCÊ FEZ ISSO, DE XINGAR, ZOAR OU OFENDER ALGUM ALUNO POR CAUSA DA COR DA PELE DELE OU DELA?

56 - JÁ ESTAMOS QUASE NO FIM! SÓ MAIS ALGUMAS PERGUNTAS! NAS PRÓXIMAS QUESTÕES EU VOU TE FALAR UMA FRASE E VOCÊ VAI RESPONDER SE ISSO ACONTECE OU NÃO COM VOCÊ

57 - 'QUANDO VOCÊ DECIDE FAZER ALGUMA COISA VOCÊ SEMPRE VAI ATÉ O FIM'

58 - 'VOCÊ QUASE SEMPRE TOMA SUAS DECISÕES SEM PENSAR NAS CONSEQUÊNCIAS'

59 - 'VOCÊ TOMA DECISÕES COM A PRIMEIRA COISA QUE PASSA PELA SUA CABEÇA'

60 - 'VOCÊ PENSA EM TODAS AS OPÇÕES ANTES DE DECIDIR POR ALGUMA COISA'

61 - 'VOCÊ TOMA DECISÕES E DEPOIS SE ARREPENDE DELAS'

62 - 'VOCÊ SEMPRE TOMA DECISÕES SEM PENSAR'

63 - 'VOCÊ MUDA DE IDEIA SOBRE ALGUMA COISA VÁRIAS VEZES NO DIA'

64 - 'QUANDO VOCÊ DECIDE ALGO, TE IMPORTA O QUE SEUS AMIGOS PENSAM'

65 - 'QUANDO VOCÊ DECIDE ALGO, VOCÊ SE IMPORTA COM O QUE SEUS PAIS OU RESPONSÁVEIS PENSAM'

66 - NAS PRÓXIMAS QUESTÕES, VOCÊ DEVE IMAGINAR E RESPONDER SE ISSO É FÁCIL OU DIFÍCIL PARA VOCÊ. SE FOR FÁCIL VOCÊ DEVE CLICAR NO BOTÃO VERDE, MAS SE FOR DIFÍCIL CLIQUE NO BOTÃO VERMELHO

67 - DIZER ALGO DE BOM A UM AMIGO, É FÁCIL OU DIFÍCIL PARA VOCÊ?

68 - PEDIR UM FAVOR, É FÁCIL OU DIFÍCIL PARA VOCÊ?

69 - DIZER 'NÃO' QUANDO ALGUÉM TE PEDE PARA FAZER ALGO QUE VOCÊ NÃO QUER, É FÁCIL OU DIFÍCIL PARA VOCÊ?

70 - PEDIR AJUDA QUANDO VOCÊ TEM ALGUM PROBLEMA, É FÁCIL OU DIFÍCIL PARA VOCÊ?

71 - AJUDAR ALGUÉM CONHECIDO QUE PRECISA DE AJUDA, É FÁCIL OU DIFÍCIL PARA VOCÊ?

72 - VOCÊ CHEGOU NA ÚLTIMA QUESTÃO. AGORA VOCÊ DEVE RESPONDER SE CONCORDA OU DISCORDA COM AS FRASES QUE FALAREI PARA VOCÊ SOBRE A SUA ESCOLA. SE VOCÊ CONCORDA, CLIQUE NO BOTÃO VERDE, MAS SE VOCÊ DISCORDA, CLIQUE NO BOTÃO VERMELHO

73 - A MAIORIA DOS ALUNOS DA MINHA SALA GOSTA DE ESTAR JUNTOS

74 - A MAIORIA DOS ALUNOS DA MINHA SALA É GENTIL E GOSTA DE AJUDAR

75 - OS OUTROS ALUNOS ME ACEITAM COMO EU SOU

76 - EU ME IMPORTO COM AS MINHAS NOTAS NA ESCOLA

77 - EU RESPEITO MUITO O QUE MEUS PROFESSORES DIZEM

78 - EU ACHO QUE A ESCOLA É IMPORTANTE PARA O MEU FUTURO

PRE 7o ANO

G1 - Página 1

x1 - COD ACESSO

Resposta:

x2 - COD ANONIMATO

Resposta:

1 - Qual seu sexo?

- Masculino
- Feminino

2 - Qual é cor da sua pele?

- Branca
- Preta
- Parda
- Amarela
- Indígena

3 - Qual é a sua idade? (Em anos)

Resposta:

4 - Como você se sente em relação à escola atualmente?

- Gosto muito
- Gosto um pouco
- Não gosto

5 - Como foram suas notas na escola no último ano?

- Baixas
- Médias
- Altas

6 - Você já experimentou alguma bebida alcoólica? (Exemplos: Cerveja, Chopp, Vodka, Vinho, Ice, Pinga, Batidas)

- Não
- Sim

7 - Quantos anos você tinha quando experimentou bebida alcoólica pela primeira vez?

Resposta:

8 - Nos últimos 12 meses, você tomou alguma bebida alcoólica?

- Não
- Sim

9 - Nos últimos 30 dias, você tomou alguma bebida alcoólica?

Não Sim, tomei de 1 a 5 dias no mês Sim, tomei de 6 a 19 dias no mês Sim, tomei 20 dias ou mais no mês

10 - Quantas vezes na vida você ficou bêbado devido a bebidas alcoólicas?

Nunca fiquei bêbado 1 ou 2 vezes 3 a 5 vezes 6 a 9 vezes Mais de 10 vezes

11 - Você já tomou 5 doses ou mais de bebidas alcoólicas em uma única ocasião?

Não Sim

12 - Nos últimos 12 meses, você tomou 5 doses ou mais de bebidas alcoólicas em uma única ocasião?

Não Sim

13 - Nos últimos 30 dias, quantas vezes você tomou 5 doses ou mais de bebidas alcoólicas em uma única ocasião?

Nenhuma vez 1 vez 2 vezes 3 a 5 vezes Mais de 5 vezes

14 - Você já fumou cigarro?

Não Sim

15 - Nos últimos 12 meses, você fumou algum cigarro?

Não Sim

16 - Nos últimos 30 dias, você fumou algum cigarro?

Não Sim, fumei 1 a 5 dias no mês Sim, fumei 6 a 19 dias no mês Sim, fumei 20 dias ou mais no mês

17 - Quantos cigarros você fuma por dia?

Não fumo De 1 a 10 cigarros por dia de 11 a 20 cigarros por dia mais de 20 cigarros por dia

18 - Você já cheirou ou baforou algum produto para sentir brisa ou barato?

Não Sim

19 - Nos últimos 12 meses, você cheirou ou inalou algum produto para sentir brisa ou barato?

Não Sim

20 - Nos últimos 30 dias, você cheirou ou inalou algum produto para sentir brisa ou barato?

Não Sim, cheirei de 1 a 5 dias no mês Sim, cheirei de 6 a 19 dias no mês Sim, cheirei 20 dias ou mais no mês

21 - Você já experimentou maconha?

Não Sim

22 - Nos últimos 12 meses, você usou maconha?

Não Sim

23 - Nos últimos 30 dias, você usou maconha?

Não Sim, usei de 1 a 5 dias no mês Sim, usei de 6 a 19 dias no mês Sim, usei 20 dias ou mais no mês

24 - Você já experimentou cocaína?

Não Sim

25 - Nos últimos 12 meses, você usou cocaína?

Não Sim

26 - Nos últimos 30 dias, você usou cocaína?

Não Sim, usei de 1 a 5 dias no mês Sim, usei de 6 a 19 dias no mês Sim, usei 20 dias ou mais no mês

30 - Você já experimentou holoten ou carpinol?

Não Sim

31 - NO PRÓXIMO ANO, você ACHA que pode se envolver nas situações descritas abaixo?

	Não	Sim
Fumar cigarros		
Beber bebidas alcoólicas		
Ficar bêbado(a)		
Fumar maconha		
Usar outras drogas não permitidas		

32 - Você SOFREU, na escola, algum destes tipos de atitudes de intimidação / provocação, nos últimos 30 dias?

	Nunca	Somente 1 ou 2 vezes	2 ou 3 vezes por mês	Cerca de 1 vez por semana	Várias vezes por semana
Alguns aluno(a)s me falaram palavrões, me xingaram, zombaram de mim ou me fizeram brincadeiras de mau gosto					
Alguns aluno(a)s me deixaram de fora das atividades de propósito, me excluíram do seu grupo de amigo(a)s, ou me ignoraram completamente					
Alguns aluno(a)s me bateram, me chutaram, me empurraram ou me trancaram sozinho(a) dentro de uma sala					

	Nunca	Somente 1 ou 2 vezes	2 ou 3 vezes por mês	Cerca de 1 vez por semana	Várias vezes por semana
Alguns aluno(a)s disseram mentiras sobre mim ou espalharam falsos boatos, tentando fazer com que os outros não gostem de mim	○	○	○	○	○
Alguns aluno(a)s me roubaram dinheiro ou outras coisas ou as danificaram de Propósito	○	○	○	○	○
Alguns aluno(a)s me ameaçaram ou me forçaram a fazer coisas que eu não queria fazer	○	○	○	○	○
Alguns aluno(a)s me insultaram ou fizeram comentários ofensivos sobre minha raça ou cor de pele	○	○	○	○	○

33 - Durante quanto tempo estas provocações ou intimidações duram ou duraram na escola?

○ Não fui intimidado na escola nos últimos 2 ou 3 meses ○ Cerca de 6 meses ○ Cerca de 1 ou 2 semanas ○ Cerca de 1 ano ○ Cerca de 1 mês

○ Isto acontece há vários anos

34 - Você PROVOCOU na escola, estes tipos de atitudes de intimidação / provocação, durante os ÚLTIMOS 30 dias:

	NUNCA	Somente 1 ou 2 vezes	2 ou 3 vezes por mês	Cerca de 1 vez por semana	Várias vezes por semana
Eu insultei com palavrões, xinguei, zombei ou fiz brincadeiras de mau gosto com um/uma ou vário(a)s colegas	○	○	○	○	○
Eu bati, dei pontapés ou empurrei ele/ela, ou tranquei ele/ela sozinho dentro de uma sala	○	○	○	○	○
Eu contei mentiras ou espalhei falsos boatos sobre ele/ela tentando fazer com que os outros não gostassem mais dele(s) ou dela(s)	○	○	○	○	○
Eu peguei dinheiro ou outras coisas ou danifiquei de propósito os pertences dele/dela	○	○	○	○	○
Eu ameacei ou forcei alguém a fazer coisas que ele/ela não queria fazer	○	○	○	○	○
Eu deixei alguém de fora das atividades de propósito, excluí ele/ela do meu grupo de amigo(a)s, ou ignorei ele/ela completamente	○	○	○	○	○
Eu insultei ele/ela ou fiz comentários ofensivos sobre sua raça ou cor de pele	○	○	○	○	○

35 - Durante quanto tempo você praticou estas provocações ou intimidações na escola?

○ Não intimei ninguém na escola nos últimos 2 ou 3 meses ○ Cerca de 6 meses ○ Cerca de1 ou 2 semanas ○ Cerca de 1 ano ○ Cerca de 1 mês

○ Isto acontece há vários anos

36 - Até que grau o seu responsável (pai/mãe ou outro responsável) estudou? Considere aqui o responsável que tiver maior grau de formação.

○ Nunca estudou ○ Fez até 1a, 2a, ou 3a série do ensino fundamental ○ Fez até a 4a, 5a, 6a ou 7a série do ensino fundamental

○ Fez até a 8a série do ensino fundamental ○ Fez até a 1a e 2a série do ensino médio (1º e 2º colegial) ○ Terminou o ensino médio (3º colegial)

Começou a faculdade, mas não terminou o curso Fez faculdade completa (terminou o curso)

37 - Na sua casa tem?

	Não tem (0)	1	2	3	4 ou +
Máquina de lavar lOUÇAS					
Microondas					
Computador ou Notebook (Não vale tablet)					
Máquina de lavar ROUPAS (Não vale tanquinho)					
Funcionário/Empregado que trabalha todos os dias para sua família					
Máquina secadora de ROUPAS					
Banheiros					
Geladeira					
Aparelho de dVD					
Moto (motocicleta)					
Freezer (da geladeira ou separado)					
Carro					

38 - A água que você utiliza na sua casa é?

Encanada (canos) De poço ou nascente de outro meio

39 - Como é a rua em que você mora?

Asfaltada / Pavimentada Terra / Cascalho

40 - Você concorda com as afirmações listadas abaixo sobre como tomar decisões?

	Concordo	Discordo
Quando eu decido fazer alguma coisa eu sempre vou até o fim		
Frequentemente tomo minhas decisões sem pensar nas consequências		
Às vezes, tomo decisões com a primeira coisa que passa pela minha cabeça		
Eu penso em todas as opções antes de decidir por alguma coisa		
Às vezes, tomo decisões e depois me arrependo delas		
Sempre tomo decisões sem pensar		
Às vezes, mudo de ideia várias vezes no dia		
Quando decido algo, não me importa o que meus amigos pensam		
Quando decido algo, não me importa o que meus pais ou responsáveis pensam		

41 - Imagine você nas situações abaixo. O que você faria nestes casos?

	Eu diria NÃO	Eu ACEITARIA	Não sei
Se um membro da sua família te oferece álcool			
Se um amigo próximo da família te oferece maconha			
Se um colega de escola te oferece cigarro			

42 - Imagine você fazendo as coisas que estão listadas abaixo. Quão fácil ou difícil elas seriam para você?

	Muito fácil	Fácil	Difícil	Muito difícil
Dizer algo bom a um amigo				

	Muito fácil	Fácil	Difícil	Muito difícil
Pedir um favor	○	○	○	○
Dizer 'não' quando alguém me pede para fazer algo que eu não quero	○	○	○	○
Pedir ajuda quando tenho algum problema	○	○	○	○
Ajudar alguém conhecido que precisa de ajuda	○	○	○	○

43 - Você concorda com as seguintes descrições em relação a sua escola?

	Concordo	Discordo
A maioria dos alunos da minha sala gosta de estar juntos	○	○
A maioria dos alunos da minha sala é gentil e gosta de ajudar	○	○
Outros alunos me aceitam como eu sou	○	○
Eu me importo com as minhas notas na escola	○	○
Eu respeito muito o que meus professores dizem	○	○

44 - Considerando o que tem ocorrido com você nos ÚLTIMOS 6 MESES, quão verdadeiro é para você as afirmações listadas abaixo? Escolha a opção que melhor lhe representa.

	Falso	Mais ou menos verdadeiro	Verdadeiro
Eu tento ser legal com as outras pessoas. Eu me preocupo com os sentimentos dos outros	○	○	○
Não consigo parar sentado quando tenho que fazer a lição ou comer	○	○	○
Muitas vezes tenho dor de cabeça, dor de barriga ou enjoo	○	○	○
Tenho boa vontade para dividir, emprestar minhas coisas (comida, jogos, canetas)	○	○	○
Eu fico muito bravo e geralmente perco a paciência	○	○	○
Eu estou quase sempre sozinho. Eu geralmente faço coisas sozinho ou fico na minha	○	○	○
Geralmente sou obediente e normalmente faço o que os adultos me pedem	○	○	○
Tenho muitas preocupações, muitas vezes pareço preocupado com tudo	○	○	○
Tento ajudar se alguém parece magoado, preocupado ou sentindo-se mal	○	○	○
Estou sempre agitado, balançando as pernas ou mexendo as mãos	○	○	○
Eu tenho pelo menos um bom amigo ou amiga	○	○	○
Eu brigo muito. Eu consigo fazer com que as pessoas façam o que eu quero	○	○	○
Frequentemente estou chateado, desanimado ou choroso	○	○	○
Em geral, os outros jovens gostam de mim	○	○	○
Facilmente perco a concentração	○	○	○
Fico nervoso quando tenho que fazer alguma coisa diferente, facilmente perco a confiança em mim mesmo	○	○	○
Sou legal com crianças mais novas	○	○	○
Geralmente eu sou acusado de mentir ou trapacear	○	○	○
Os outros jovens me perturbam, 'pegam no pé'	○	○	○
Frequentemente me ofereço para ajudar outras pessoas (pais, professores, crianças)	○	○	○
Eu penso antes de fazer as coisas	○	○	○
Eu pego coisas que não são minhas, da casa, da escola ou de outros lugares	○	○	○
Eu me dou melhor com os adultos do que com pessoas da minha idade	○	○	○
Eu sinto muito medo, eu me assusto facilmente	○	○	○
Eu consigo terminar as atividades que começo. Eu consigo prestar atenção			

47 - Imagine você nas seguintes situações. Algumas podem ser muito familiares para você e outras menos, e você pode se sentir menos confortável em responder. Apenas responda da melhor forma que puder.

Marque a opção que mais se aproxima da sua opinião.

	Não	Sim	Talvez
Você e seu/sua amigo(a) estão numa festa onde encontram pessoas novas e você fica interessado(a) em conhecê-las. Alguém oferece um cigarro de maconha. O(a) seu/sua amigo(a) aceita. Você aceita?	○	○	○
Você e seu/sua amigo(a) estão estudando para uma prova muito importante no dia seguinte. Vocês estão estressados e precisam se acalmar. Seu/sua amigo(a) sugere que um cigarro de tabaco ajudaria e te oferece um. Você aceita?	○	○	○
Dois dias depois, você e seu/sua amigo(a) ficam sabendo que passaram na prova e querem comemorar. Você ainda tem uma grana (R$) e tem uma loja de bebida alcoólica próximo dali. Você compraria alguma bebida alcoólica?	○	○	○

48 - Você concorda com as afirmações listadas abaixo sobre o uso de drogas? Marque a resposta que mais se aproxima de sua opinião.

	Discordo	Concordo
Usar drogas pode ser uma atividade que dá prazer	○	○
Uma pessoa jovem não deveria jamais usar drogas	○	○
Usar drogas é divertido	○	○
Há muitas coisas mais arriscadas do que usar drogas	○	○
Todos que usam drogas um dia se arrependem	○	○
As leis sobre drogas deveriam ser mais fortes	○	○
Uso de drogas é um dos maiores problemas de um país	○	○
Drogas ajudam as pessoas a experimentar a vida com mais intensidade	○	○
As escolas deveriam ensinar os perigos de se usar drogas	○	○
A polícia não deveria perturbar pessoas que estão experimentando drogas	○	○
Experimentar drogas é abandonar o controle da sua vida	○	○

ANEXO 4

Modelo inicial do roteiro de entrevista semi-estruturada para cada um dos policiais instrutores (este roteiro ainda será adaptado após a observação das aulas e da formação).

Contexto Inicial

1. Antes do Proerd, você tinha algum tipo de experiência anterior com programas de prevenção ao uso de drogas? Descreva.

Relações

2. Como você avalia o alinhamento entre a direção da escola e o trabalho em sala de aula para a implantação do programa? Facilidades e Dificuldades.

Implantação do Programa

3. Sobre a formação recebida para o Programa PROERD, qual o apoio que ela ofereceu para a implantação do programa em sala de aula?

4. De que maneira o material didático/instruções apoiou o desenvolvimento em sala de aula?

5. Como as demandas geradas pela implantação do programa de prevenção (planejamento da aula, relação com a diretoria e coordenação pedagógica) estão influenciando seu cotidiano como policial?

6. Qual a sua opinião sobre trabalhar, em sala de aula, com o modelo de influência social e habilidades de vida num programa de prevenção ao uso de drogas?

7. De que forma você acredita que este programa influenciou as relações em sala de aula?

8. Como você avalia a divisão de 10 aulas para trabalhar o conteúdo abordado pelo programa? O que funcionou ou não para os alunos? Quais as facilidades e dificuldades encontradas?

9. O que você observar, no comportamento dos alunos, com relação ao desenvolvimento das habilidades de vida (pensamento crítico, tomada de decisões, solução de problemas, empatia, comunicação eficaz, etc), tanto em sala de aula, quanto em outros ambientes da escola)?

10. Quais as lições apreendidas que podem auxiliar na ampliação do projeto?

ANEXO 5

Formulário de observação da aplicação da Lição 1 (os formulários para as outras 9 lições do 5º ano e as 10 lições do 7º ano seguem o mesmo padrão, mudando apenas os nomes das atividades referentes às mesmas).

Formulários para monitoramento da aplicação do *PROERD* - aula a aula – OBSERVADOR

Lição 1

CIDADE_____ CÓDIGO_____

ESCOLA_____CÓDIGO _____

CLASSE _____CÓDIGO _____

Data (dd/mm/aa): _____

Esta unidade foi executada em aproximadamente:_____minutos

Número de estudantes presentes nesta unidade: _____

As seguintes atividades foram realizadas: (por favor, marque os itens correspondentes às atividades realmente realizadas durantes esta aula, em particular. Relate as razões para pular qualquer atividade nos comentários livres)

ATIVIDADE

1A ☐ Combinados PROERD

Houve mudança? ☐ Sim ☐ Não

Caso afirmativo, descreva o que mudou (*anote no verso do formulário*)

1B ☐ Praticando o modelo de tomada de decisão

Houve mudança? ☐ Sim ☐ Não

Caso afirmativo, descreva o que mudou (*anote no verso do formulário*)

Avalie nesta aula:

	Nenhum	Pouco	Moderado	Alto	Muito alto
Interesse dos estudantes					
Nível de interatividade entre os alunos					
Nível de interatividade instrutor-aluno					
Domínio da aula demonstrado pelo instrutor					

Descreva abaixo o que você observou durante esta aula com relação à:

Interações aluno-aluno e instrutor-aluno:

Comportamentos dos alunos:

Comportamentos do instrutor:

Estímulo à participação dos alunos:

Eventos marcantes:

Espaço físico:

Materiais disponíveis:

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Substance Abuse Treatment, Prevention, and Policy

RESEARCH Open Access

Implementation fidelity of a Brazilian drug use prevention program and its effect among adolescents: a mixed-methods study

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Abstract

Background Based on the US DARE-kiR, a version of the Keepin' it REAL program, the Drug and Violence Resistance Educational Program (PROERD) is the most widely implemented Brazilian prevention program. It originates from the translation of the DARE-kiR, a version of the Keepin' it REAL program. Previous results suggest its inefficiency in preventing drug use among Brazilian adolescents. Since kiR fidelity can impact program outcomes, this mixed-methods study evaluates the PROERD implementation fidelity and its effects on preventing drug use among adolescents.

Methods Data from two cluster randomized controlled trials (cRCTs) with 4,030 students from 30 public schools in São Paulo (1,727 fifth graders and 2,303 seventh graders), assessed at two-time points, were analyzed quantitatively. After implementing each lesson during the cRCT, 19 PROERD instructors answered fidelity forms. The effect of PROERD fidelity on alcohol, cigarettes, marijuana, inhalant, and cocaine use (the last two only among seventh graders) in the six months prior to follow-up assessment was analyzed by logistic regressions for fifth grade and mixed effect models for seventh graders. For qualitative analysis, semi-structured interviews were conducted with PROERD instructors and investigated by thematic analysis.

Results Quantitative analysis showed that PROERD implementation fidelity had no impact on drug use among fifth and seventh graders. Conversely, the qualitative analysis revealed important aspects that may influence implementation fidelity and consequently program effectiveness, such as adaptations made by instructors, school infrastructure, among others, besides program application.

Conclusion PROERD requires cultural adaptation to improve its implementation in Brazilian public schools.

Keywords Implementation fidelity, Prevention, Mixed-methods, Adolescent, School, Drugs

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Introduction

Adolescence is the typical period during which initial alcohol and drug use occurs [1], impacting mental health [2] and facilitating the development of drug-related issues [3], as well as drug dependence in adulthood [4]. Hence, alcohol use in early adolescence is an important public health concern [5], contributing to the global dis- ease burden [6].

Among Brazilian adolescents between 13 and 15 years of age, 55.5% reported alcohol consumption and 9.0%had used illicit drugs at least once in their lives, whereas 22% reported episodes of drunkenness [7]. Despite being a major public health concern, few evidence-based programs for drug use prevention have been implemented and proven efficacious in Brazilian schools [8]. The Drug and Violence Resistance Educational Program (*Programa Educacional de Resistência às Drogas e à Violência* – PROERD) is the most widely implemented school-based prevention curricula, reaching approximately 40% of schools [8]. A recent study showed that PROERD failed to achieve better preventive drug outcomes in the intervention group compared to the control group for both5th and 7th grades [9]. Moreover, the program appearsto negatively impact secondary outcomes, as the seventh grade curriculum seems to increase the intention to use cigarettes in the future and chances of accepting marijuana, whereas the fifth grade curriculum slightly reduces decision-making skills [10].

Its current curriculum is a Brazilian Portuguese translation of the US DARE-Keepin'it REAL (DARE-kiR) program [11], renamed as "PROERD-Caindo na Real," and implemented by military police officers in all Brazilian states. Of wide implementation in US schools, DARE-kiR is also enforced by the military police. However, no studies have reported its impact on drug use prevention [12]. The only published paper reporting DARE-kiR findings is a quasi-experimental matched group study that looked at its impact on secondary outcomes [11]. Prior to adaptation by DARE, kiR was originally designed and developed to be implemented in 7th grade classrooms by their teachers. The original program was tested with 7th graders in Arizona-USA [13], and its culturally adapted versions were also evaluated by multiple RCTs in the US and in other countries [14–17], showing consistently positive results. As the kiR program for fifth graders proved to be ineffective, its developers recommended continued intervention only for 7th grades [18, 19]. Randomized control trial (RCT) evaluations of the kiR seventh grade curricula have shown consistently favorable results on drug use prevention in the US [13], Guatemala [14], Mexico [15], and Spain [17]. RCT evaluations of the kiR seventh grade curriculum have reported positive outcomes for discontinuing alcohol use [20] and intoxication episodes [17], as well as preventing cigarette [16, 21], marijuana [14, 16, 22] and other illicit drugs [15, 22] use. Conversely, kiR fifth grade curricula remain poorly investigated, and the only RCT reported a significantly increase in the prevalence of substance use over the 3-year period [19]. Despite the scarcity of reports on DARE-kiR implementation, some studies measured and reported findings on kiR fidelity. Marsiglia et al [23, 24] reported findings on fidelity in the context of cultural adaptation of the program to the Mexican population, as well as Cutrin to the Spanish population [17]. The only study that we are aware of that has investigated the impact of kiR implementation fidelity on programs outcomes found that the program's impact on positive outcomes can increase based on delivery quality [25]. PROERD and DARE-kiR are a translated version of the same program, share the same theoretical model of their original version (kiR program). The main difference between the programs is that kiR is implemented by teachers, and DARE-kiR and PROERD are implemented by police officers.

Considering these unexpected results from the Brazilian version of the DARE-kiR program, we must investigate which factors might be affecting the outcomes. One factor that reportedly impacts a prevention program's effectiveness is the excellence (or lack thereof) of its implementation [26], which can be determined by implementation fidelity, that is, the degree to which an intervention and its core components are delivered as intended by the program developers [27, 28]. A crucial aspect of implementation, that provides important information for measuring fidelity, especially when the program is not implemented by researchers, is the dosage, that is, the amount of program delivered [29]. In a review, Hill and Erickson [30] found that implementation fidelity plays an important role in program outcomes, as programs delivered with high or moderate levels of fidelity show more than double the potential to achieve positive results, contradicting the null outcome seen in our study. Despite the scarcity of reports on DARE-kiR implementation, a study investigating kiR implementation fidelity found that its impact can increase based on the quality of delivery [25].

According to Pettigrew et al. [31], teachers may adapt the program to their teaching characteristics. Such adaptation of evidence-based programs, that is, modifying the design or delivery of an intervention to address cultural and contextual specificities, can impact their results [32]. However, the relation between fidelity and adaptation remains controversial, with some researchers arguing that practices implemented with high fidelity result in better outcomes [33], while others highlight the importance of balancing between fidelity and flexibility for a successful interventions [34]. These findings point to the importance of identifying aspects that may require adaptation, as previously done among populations in

Guatemala [35] and Mexico [23], as well as in rural communities in Pennsylvania and Ohio [25].

Given the relevance of implementation fidelity to better program outcomes, we hypothesized that PROERD delivered with high fidelity would have a better effect among students. Hence, this study sought to evaluate, by quantitative and qualitative methods, the PROERD implementation fidelity and its effect on drug use prevention.

Methods

Of a mixed-methods design, the study obtained quantitative data from two cluster randomized controlled trials (cRCTs) and collected qualitative data using (1) questionnaires applied to cRCTs participants, (2) fidelity forms answered by instructors (police officers) after each cRCT lesson, and (3) semi-structured interviews conducted with the instructors who delivered lessons. The interviews and qualitative analysis allowed us to answer research questions and clarify cRCT findings and quantitative results [36].

Intervention

The school-based "PROERD-Caindo na Real" program consists of 10 weekly classes (50 min each) delivered by trained police officers in the classroom environment, using student and teacher manuals. The police offi- cer responsible for teaching the class uses the teacher's manual, which provides information on procedures, objectives, materials needed, and tips for each lesson, including 1–3 activities. All participating officers underwent 80 h of training offered by the Military Police under the guidance of DARE America. Fifth and seventh graders were taught by the same instructor. All curricula were developed based on theories of narrative engagement [37], the principle of cultural grounding [38], social and emotional learning [39], and normative beliefs on drug use [40]. In Brazil, the program is implemented by the Military Police. Despite the lack of information aboutthe program's cultural adaptation process, a comparative reading of the DARE-kiR and PROERD manuals suggests that the latter is simply a translation into Brazilian Portuguese of the DARE material, lacking cultural and socio-environmental elements specific to the Brazilian context. Thus, its effectiveness needs to be assessed considering this factor.

Quantitative methods

cRCT study design

Two parallel two-arm cRCTs were conducted with 4,030 fifth and seventh graders from 30 public schools in São Paulo in 2019 to evaluate the PROERD curricula for drug use prevention. Of these, 1,727 were fifth graders enrolled in 72 classes at 28 schools, and 2,303 were seventh graders enrolled in 90 classes at 30 schools. Both intervention groups attended 10 classes taught by 19 trained police officers; the control group received no intervention. State schools in the municipality of São Paulo that offered 5th and 7th grade and had not received PROERD in the last three years were included in the randomization. The first 30 schools listed were considered the study sample and the following 29 schools were included as backup in case of refusal. In the schools that agreed to participate in the study, all 5th and 7th graders participated in the cRCT. Sample size calculation, school selection, and the randomization process were performed according to Valente & Sanchez [10].

First data source: questionnaires applied to cRCT participants

Data were collected at two-time points. Baseline assessment was conducted prior to program implementation between February and March 2019. As the Brazilian academic year usually runs from February to December, follow-up data were collected 9 months after baseline in November and December 2019. Control and inter- vention data were collected simultaneously. An anony- mous, self-administered audio-guided questionnaire was applied to students using smartphones by researchers in the classroom without a teacher. This instrument has been employed in previous studies to evaluate school-based drug prevention programs in Brazil [41, 42]. It was designed based on the European Drug Addiction Pre- vention Trial (EU-DAP) questionnaire [43], translated and adapted into Brazilian Portuguese. We added a few questions from the World Health Organization (WHO)questionnaire, used in the VI Brazilian Survey on Drug Use among Students [44], and the National Survey of School Health (PENSE) questionnaire, from the Ministry of Health [45].

The outcome analyzed was the prevalence of drug use among fifth and seventh graders in the past 6 monthsbefore the follow-up assessment (yes or no), including alcohol, tobacco, marijuana, binge drinking, inhalants, and cocaine (the last two assessed only among seventh graders). During follow-up, the adolescents answered questions such as "Have you drunk alcoholic beverages in the past six months?" Binge drinking was considered as the consumption of five or more alcoholic beverages on a single occasion.

Control variables consisted of sex (male/female), age, and socioeconomic status (SES). SES was assessedby the Brazilian Association of Research Companies (ABEP) scale, which considers the schooling level of the head of the household and the goods and services used. ABEP score ranges from 1 to 100 points, graded from A (highest) to D/E (lowest) according to established cut-off points: A (45–100 points), B (29-44 points), C (17-28 points), and D/E (0–16) [46].

In each assessment, students provided a code generated from letters and numbers of their personal information, which allowed to match pre- and post-tests, ensur- ing anonymity and confidentiality, as used previously indrug prevention program evaluations [47]. Since some students may overreport their drug use, we included questions related to fictional drugs called "holoten" and "carpinol." Questionnaires positive for lifetime use of these drugs were excluded from the analysis (14 and 12 questionnaires at baseline and 11 and 8 questionnaires at follow-up for fifth and seventh graders, respectively).

Second data source: fidelity forms answered by instructors

Data on implementation fidelity were collected using self-administered online questionnaires completed by the instructors after each lesson, reporting whether the scheduled activities were delivered (yes or no) and whether any activities were altered by the instructors (yes or no). The fidelity forms listed all activities planned for each program lesson, based on the teacher's manual. The first author (J.D.G.) trained the police officers on how to fill the form. Each item had data on the percentage of activity completeness (the numerator was the number of activities delivered, and the denominator was the total number of activities planned), and percentage of alterations (the numerator was the activities instructors reported changing, and the denominator was the number of activities planned). A fidelity variable for each class was calculated as follows: fidelity = % completeness× (1-% alteration). Classes were then divided into two groups according to the level of fidelity: those that received ≥ 80% of the proposed PROERD activities were considered to have completed the program, whereas those that received ˂80% of the activities were considered to have incomplete implementation.

Since we evaluated 35 fifth grades and 47 seventh grades, and awaited 10 fidelity forms from each class (1 for each of the 10 lessons delivered), we expected a total of 350 and 470 forms for fifth and seventh grade classes, respectively. However, some instructors failed to return the forms, resulting in 47 (13%) and 83 (17,66%) fifth and seventh grade forms not delivered and considered missing. Online completion allowed researchers to mark all responses as "mandatory," thus avoiding missing answers. Completeness and alteration calculations were proportional to the information available without missing data.

Qualitative methods

After the intervention, data were collected by semi-structured interviews conducted with all 19 PROERD instructors involved in the cRCT (19 instructors delivered the program in 30 intervention schools).

Third data source: semi-structured interviews with instructors

Qualitative data were collected by semi-structured in-depth interviews [48], with a set of previously defined questions, to which the interviewer was free to add new questions if necessary. To reduce interviewer interfer- ence and facilitate data organization, comparison, and analysis, all interviewees were asked the same basic set ofquestions [49].

Interviews lasted around 45 min and touched on the following topics: (i) how and why the participants became a PROERD instructor; (ii) how they perceive the effects (if any) of the program; (iii) their relationship with the school counselor and how it could affect the program's impact; (iv) whether they considered the program training sufficient and how it influenced their work in PROERD; (vi) their opinions on the material and its content; (vii) what planned activities were well and poorly received; (viii) differences in applying the curricula for fifth and seventh graders; (ix) how PROERD demands affected other officer duties and vice versa; (x) what they would change in the program; (xi) what could be done to improve PROERD implementation. All interviews were recorded with prior consent from the interviewees.The resulting data were anonymized, transcribed verba-tim, and identified by an alphanumeric code combining the letter (P), for police officer, and a random number assigned according to the order of the interviews (01, 02, 03…).

Data analysis

Quantitative analysis

Sociodemographic characteristics and drug use data underwent descriptive analysis, with categorical variables expressed as numbers and percentages, and numerical variables expressed as means and standard deviations. We then performed inferential analysis to assess the impact of PROERD implementation fidelity on reducing adolescent drug use. For seventh graders, the impact of PROERD implementation fidelity on alcohol, cigarette, marijuana, inhalants, and cocaine use and binge drink-ing in the past 6 months was examined by a mixed-effects linear model. This model considers variability within individuals (from baseline to follow-up) and between individuals (children nested in schools), highlighting the relations between the observed response and explanatory covariates [50, 51]. Given the extremely low prevalenceof drug use among fifth graders, this impact was assessed using logistic regressions. All analyses considered 0 as control group, 1 as low fidelity, and 2 as high fidelity. Analysis was performed using STATA software version 17.0 and adjusted for sex, age, and SES, considering non-independence of the sample (children nested in school).

Data obtained from the fidelity forms on the completeness and alterations of PROERD lessons were underwent

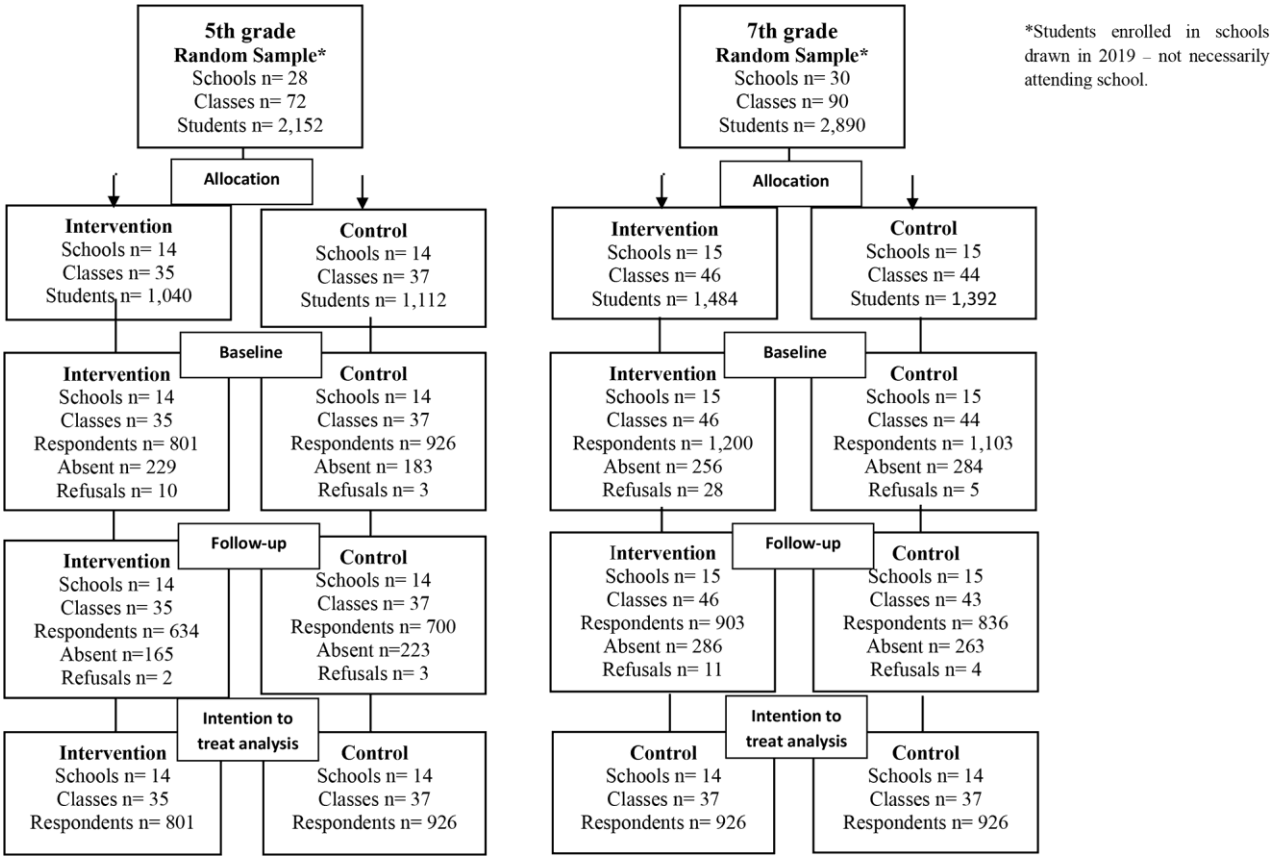

Fig. 1 Flowchart of the randomized controlled trial assessing the effect of the PROERD drug use prevention program among 5th and 7th graders

descriptive analysis, summarized as numbers and percentages.

Qualitative analysis

Data underwent thematic analysis [52] using axial coding, in which a priori analytical categories were generated based on interview guide topics, subsequently linked to other subcategories along the lines of their properties and dimensions [53]. Of the 25 codes identified, we chose to analyze 8 codes based on their possible influence on PROERD effectiveness (see Figure S1), organized into 3 topics: (1) adaptations, (2) accumulation of functions, and (3) school infrastructure. Qualitative analysis was performed using ATLAS.ti © version 7.5.4.

After initial coding performed by the first author (J.D.G.), a PhD candidate in public health with training and experience in qualitative analysis, data underwent interpretive triangulation by the second author (R.G.C.), an anthropologist and PhD candidate in collective health, who analyzed the data in parallel. Disagreements were resolved by discussions, and a second review of the interview transcripts. Topics reported and discussed in this manuscript resulted from a consensus among researchers.

Results

Quantitative analysis

Among fifth graders, 1,727 students answered the baseline questionnaire and 1,334 the follow-up questionnaire (77.24%). Among seventh graders, 2,303 students answered the baseline questionnaire and 1,739 the follow-up questionnaire (75.51%) (Fig. 1).

Table 1 summarizes the characteristics of the fifth and seventh graders who participated in the cRCT baseline assessment. At baseline, the intervention and control groups were homogenous in terms of sex, age, and SES (see Table S1 and Table S2 in the Supplementary File). The attrition analysis found no significant difference between groups and between sex. As expected, however, students who missed the 9-month follow-up showed a significantly higher prevalence of substance use at baseline, especially among 7th graders [42]. Table 2 presents the descriptive results of drug use at follow-up according to group and level of implementation fidelity. Alcohol was the most commonly used drug in both grades and groups.

As for program implementation fidelity, 37.1% of fifth grade classes received the program with high fidelity, with lesson seven (effective communication) being the

Table 1 Distribution of 5th and 7th graders according to sociodemographic data, drug use (alcohol, binge drinking, tobacco and marijuana) and allocation group in the cluster randomized controlled trial of the PROERD program, according to baseline. Brazil, 2019 (N = 4,030; 1,727 5th and 2,303 7th graders)

	Total		Intervention		Control	
	N	%	N	%	N	%
5th grade students (N = 1,727)			**(N = 801)**		**(N = 926)**	
Gender						
Male	882	51.07	432	53.93	450	48.60
Female	845	48.93	369	46.07	476	51.40
Age (mean ± SD)	10.12 ± 0.65		10.10 ± 0.68		10.14 ± 0.61	
SES[a]						
A	117	9.00	49	7.94	68	9.96
B	447	34.38	224	36.30	223	32.65
C	646	49.69	309	50.08	337	49.34
D-E	90	6.92	35	5.67	55	8.05
Alcohol						
Past year Use	161	9.36	81	10.18	80	8.65
Binge drinking						
Past year Use	20	1.16	9	1.13	11	1.19
Tobacco						
Past year Use	12	0.70	6	0.75	6	0.65
Marijuana						
Past year Use	4	0.23	1	0.13	3	0.33
7th grade students (N = 2,303)			**(N = 1,200)**		**(N = 1,103)**	
Gender						
Male	1,187	51.54	621	51.75	566	51.31
Female	1,116	48.46	579	48.25	537	48.69
Age (mean ± SD)	12.28 ± 0.72		12.28 ± 0.74		12.27 ± 0.71	
SES[a]						
A	130	5.71	74	6.25	56	5.12
B	773	33.93	416	35.14	357	32.63
C	1,222	53.64	629	53.13	593	54.20
D-E	153	6.72	65	5.49	88	8.04
Alcohol						
Past year Use	442	19.26	234	19.57	208	18.93
Binge drinking						
Past year Use	132	5.77	71	5.95	61	5.58
Tobacco						
Past year Use	36	1.57	20	1.67	16	1.46
Marijuana						
Past year Use	41	1.79	22	1.84	19	1.73
Inhalants						
Past year Use	57	2.49	31	2.60	26	2.37
Cocaine						
Past year Use	2	0.09	0	-	2	0.18

[a] SES: Socioeconomic status according to ABEP Scale – A (45 to 100 points), B (29 to 44 points), C (17 to 28 points) and D/E (0-16 points), where A is the highest and E the lowest

most incomplete (20% completeness) and lesson three (making choices) the most altered (17.9% alteration). Similarly, 61.7% of seventh grade classes received the program with high fidelity, with lesson ten (eco map)being the most incomplete (67.5% completeness) and les- son four (assertive refusal) the most altered (21.6% altera-tion) **(**Table 3**)**. We observed no effect of implementation fidelity on reducing drug use for either grade (see Tables 4 and 5).

Qualitative analysis

Table S3 (Supplementary File) summarizes the interview-ees' characteristics, and Annex S1 (Supplementary File) presents the semi-structured interview script applied to police officers.

Table 2 Descriptive fidelity and drug use[c] in the follow-up assessment

	Control		Intervention			
			Low fidelity[a]		High fidelity[b]	
	N	%	N	%	N	%
5th grade students (N = 926)			**(N = 513)**		**(N = 288)**	
Alcohol	55	7.88	35	8.60	12	5.33
Binge drinking	4	0.57	0	0	2	0.88
Tobacco	8	1.15	2	0.49	0	0
Marijuana	1	0.14	1	0.25	0	0
7th grade students (N = 1.103)			**(N = 498)**		**(N = 702)**	
Alcohol	216	25.96	96	24.74	150	29.24
Binge drinking	58	6.98	26	6.70	56	10.92
Tobacco	22	2.64	13	3.35	15	2.91
Marijuana	17	2.04	8	2.06	10	1.94
Inhalants	29	3.49	8	2.07	20	3.90
Cocaine	3	0.36	1	0.26	0	0

[a] High fidelity describes those who attended at least 80% of the activities proposed by PROERD curricula

[b] Low fidelity describes those who attended less than 80% of the activities proposed by PROERD curricula

[c] Drugs used in the 6 months prior to follow-up assessment

Table 3 Results on the completeness and alterations made to the PROERD program based on PROERD fidelity forms

5th grade (N = 35 classrooms)	Completeness		Alterations		7th grade (N = 47 classrooms)	Completeness		Alterations	
	N	%	N	%		N	%	N	%
Lesson 1 (N = 34)	30	88.23	5	7.35	Lesson 1 (N = 43)	42	97.67	2	2.33
Lesson 2 (N = 29)	13	44.83	7	8.05	Lesson 2 (N = 43)	41	95.35	5	11.63
Lesson 3 (N = 28)	27	96.43	5	17.86	Lesson 3 (N = 37)	5	86.49	2	2.70
Lesson 4 (N = 34)	34	100	6	8.82	Lesson 4 (N = 37)	37	100	8	21.62
Lesson 5 (N = 27)	24	88.89	6	7.41	Lesson 5 (N = 36)	36	100	3	8.33
Lesson 6 (N = 30)	23	76.67	14	15.55	Lesson 6 (N = 36)	34	94.44	4	11.11
Lesson 7 (N = 30)	6	20	4	6.67	Lesson 7 (N = 38)	34	89.47	1	2.63
Lesson 8 (N = 28)	22	78.57	8	4.28	Lesson 8 (N = 37)	32	86.49	5	6.76
Lesson 9 (N = 30)	26	86.67	2	3.33	Lesson 9 (N = 40)	34	85	7	8.75
Lesson 10 (N = 33)	29	87.88	2	3.03	Lesson 10 (N = 40)	27	67.50	10	8.33

Table 4 Effect of PROERD fidelity over the past 6-month drug use among 5th graders* (N = 1,727)

	Implementation fidelity					
	Low fidelity			High fidelity		
	OR	95%CI	p-value	OR	95%CI	p-value
Alcohol	1.05	[0.651;1.704]	0.830	0.70	[0.359; 1.365]	0.295
Binge drinking	1	-	-	1.82	[0.309; 10.687]	0.509
Tobacco	0.46	[0.096; 2.181]	0.327	1	-	-
Marijuana	2.19	[0.120; 40.046]	0.596	1	-	-

*All analyses were adjusted by sex, age and SES.

Findings were classified into three dimensions—adaptations, accumulation of functions, and school infrastructure—, corresponding to the eight codes. Table 6 summarizes the respective golden quotes.

Adaptations: Of the 19 interviewed instructors, 15 reported adapting the program, usually spontaneously and based on individual perception of student's needs (without any systematics), such as reading and writing difficulties. Instructors also chose to adapt the program when lessons were thought to flow better if applied differently from the established program. We identified four types of adaptations to PROERD curricula: alterations according to student literacy, addition of content and/or activities, changes in curricula, and exclusion of content and/or activities.

Accumulation of functions: Accumulation of two functions strongly influenced the instructor's work. Police officers responsible for implementing PROERD do not necessarily leave their regular policing duties, which hinders the planned 10-week application, as some

Table 5 Effect of PROERD fidelity over the past 6-month drug use among 7th graders* (N = 2.303)

	Implementation fidelity					
	Low fidelity			**High fidelity**		
	OR	**95%CI**	**p-value**	**OR**	**95%CI**	**p-value**
Alcohol	0.77	[0.470; 1.253]	0.292	1.05	[0.674; 1.623]	0.841
Binge drinking	0.77	[0.357; 1.658]	0.504	1.28	[0.683; 2.404]	0.441
Tobacco	1.19	[0.447; 3.161]	0.729	1.52	[0.693; 3.353]	0.294
Marijuana	NE	-	-	NE	-	-
Inhalants	1.59	[0.601; 4.204]	0.350	0.72	[0.273; 1.904]	0.510
Cocaine	NE	-	-	NE	-	-

N.e. not estimate

*All analyses were adjusted by sex, age and SES.

Table 6 Main results from the qualitative analysis regarding the PROERD instructors participating in the study (N = 19)

Dimension	**Subtopic**	**Description**	**Golden quotes**
Adaptation	Adaptation according to the student literacy	Changes made by the instructors because students would not understand the purpose of the activity or lacked proper writing-reading skills.	*"The instructor has to be aware of such difficulties and adapt the activity so that group can understand. For example, they* [the students] *have to write an essay, but one student does not know how to write. That student is at a disadvantaged, right? How will they compete—I have a medal* [to give them]*—if they do not know how to write? How will they receive the medal? So, we have to evaluate them differently, as they also have the right to receive* [the medal], *to show what they learned. You can ask them "what have you learned?", record the answer, and they will narrate, explain, and speak, and you will evaluate them along with the others* [answers]. *Hence, there has to be a different form of assessment, and you have to be ready for it." (P10)*
	Addition of content and/ or activities	Addition of content and/ or activities that go beyond the suggested topic in the material.	*"We start the subject. When I get to the topic of cigarettes, I also discuss marijuana, along with cocaine and other drugs, because none have been mentioned* [in the curricula]*!" (P18)*
	Changes in the curricula	Changes made to the PROERD curricula according to the instructors' opinions of what works or not, excluding all other reasons.	*"There are situations in the PROERD classes, during the activity, that I make changes! Changes that I think need to be done! Because if I do make changes, I believe it will not work." (P4)*
	Exclusion of content and/ or activities	Exclusion of content and/ or activities because the instructor lacks the required resources.	*"I take this opportunity to mention that the issue with video demonstration is that many schools lack the material conditions to show videos, you see? Some schools lack projectors. Some schools have an unusable television in the classroom and lack a sound system, so this is a considerable difficulty." (P10)*
Accumulation of functions	Rarely assigned other activities	Instructors supported by superiors and are rarely assigned other police activities, thus not impacting program application.	*"Our police battalion supports us. Fortunately, they assign us to other operations rather sporadically, you know? Thus, it does not influence our work considerably. We can develop the PROERD program smoothly, as individuals working with PROERD are rarely assigned other activities! For us here, it is super smooth. However, we know other places where police instructors work around the school, have to apply PROERD, and perform police operations… it doesn't work very well. Here, for us, it is super peaceful." (P7)*
	Assigned other activities because they take part in PROERD	Instructors who believe they are assigned more police duties because they take part in PROERD.	*"Police routine harms PROERD because the staff, the administration, and our hierarchical superiors often assume that PROERD officers, because we work during administrative hours teaching at schools, do nothing. Hence, they think our work* [with PROERD] *is very easy. They end up committing us to extra shifts—"oh, you don't do anything anyway, so, have an extra shift"—assigning us on weekends, at different times, because they think we don't do anything during our normal working hours, you know? And this ends up hampering* [the work with PROERD]*." (P8)*
	Assigned other activities during class hours	Instructors assigned police duties during class hours.	*"Even during class hours, they* [the superiors] *do not care. That's the problem. They usually put us on the school round, and the school round is at the same time as our* [classes], *only we… they follow their schedule, we don't." (P1)*
School infrastructure	School reality	Instructors face difficulties to implement the program at public schools that lack material and media resources.	*"But the difficulty we face concerns media resources; if you need some paper, that is a resource… Yeah, supply material. There are no conditions, the school has no material conditions." (P2)* *"What stands out is the school structure, the lack of resources and space to show* [the multimedia part of the program], *apply it, especially for seventh graders, because it* [the seventh grade curricula] *needs video, a specific room, and so many public schools lack that. It is a matter of the material and the infrastructure of the State itself." (P2)*

officers may need to report for duty during class hours or because their shifts interfere with class preparation,thus impacting the intended program delivery. Only four instructors reported being rarely assigned to other activities besides the program, which facilitated their work as PROERD instructors. Of the remaining interviewees, 11 stated being assigned to other activities or experiencing a lack of support from their superiors, as they eventually missed classes due to other duties.

School infrastructure: According to the instructors, the reality of public schools in São Paulo makes it impossible to show videos included in the program's material, resulting in adaptations to the curriculum.

Discussion

This study analyzed the impact of PROERD implementation fidelity based on quantitative and qualitative methods. According to quantitative results, the levelof implementation fidelity had no influence on the program's ability to reduce adolescent drug use. Conversely, the qualitative analysis revealed important implementation aspects that must be considered when examining the program outcomes, such as adaptations made bythe instructors, accumulation of functions (police offi- cers who are also PROERD instructors), and school infrastructure.

Contrary to previous literature, which suggested that implementation fidelity plays an important role in program outcomes [25, 30], the present study found no influence of implementation fidelity on PROERD results. Previous studies have addressed the importance of examining the program design and contextual factors to better understand null results [54, 55]. Our null findings may be explained by the lack of cultural adaptation ofthe program to the Brazilian context, which is corrobo- rated by the interviews. Moreover, compared with stu- dents in 35 other member countries of the Organization for Economic Cooperation and Development, Brazilian students' reading performance is below average (OECD, 2019; PISA, 2016), requiring a series of adaptations to the program curricula to ensure global understanding of the proposed lessons. As PROERD appears to be simplya translation of the DARE-kiR into Brazilian Portuguese, these findings highlight the importance of a reexamination by the Military Police of São Paulo, focusing on appropriate and structured cultural adaptation [56]. In the absence of a well-designed, evidence-based cultural adaptation, instructors adapt program curricula accord-ing to their judgment, making it difficult to target core elements and consequently achieve the expected results [33].

The higher rates of low implementation fidelity suggest that instructors, when implementing evidence-based programs in schools, often encounter unpredictable situations that lead to changes in activities, such as lack of school infrastructure, affecting the level of implementation fidelity [31, 33]. Differences in implementation fidelity between fifth and seventh grades may stem from the fact that, in the state of São Paulo, PROERD is delivered mainly to fifth graders, which could lead to a greater adaptation, that is, the greater the knowledge about the curricula, the more instructors feel comfortable to adapt according to their previous experience [57]. The challenge for researchers and developers of prevention programs is therefore to define core elements that are mandatory to achieve the expected outcomes [23, 56], while allowing for some flexibility so the program can adapt its theoretical model to the local context and culture [34, 56]. As the fidelity forms used quantified only the lessons taught and ignored teaching quality [58], the quantitative analysis failed to assess important aspects of implementation. Hence, a mixed-methods approach allows one to evaluate details that would be lost when only one method is used [59].

Qualitative data revealed that instructors adapted the program curricula according to aspects such as student literacy, school infrastructure, and previous teaching experience, thus compromising implementation fidelity. Previous studies [60, 61] have also found that teachers tend to adapt curricula according to their students' needs and vulnerabilities, such as reading proficiency and violence perpetration, which are prevalent issues in Brazilian public schools. In a study on teachers' adaptations of kiR curricula, Miller-Day et al. [61] reinforced that, as much as such adaptations are expected, training must instruct teachers on how to adapt without changing the core aspects of each lesson.

According to the *Survey on the Use of Information and Communication Technologies in Brazilian Schools* [62], most public schools lack computer labs and technological infrastructure, such as laptops or tablets. As the PROERD curricula for fifth and seventh grade require audiovisual resources, school infrastructure is essential for program implementation as developed by kiR creators. Warren et al. [63] state that kiR videos are essential for interventions to achieve positive outcomes. As such, PROERD implementation fidelity cannot be expected to play an important role, since core elements such as video materials are not delivered as planned.

According to Medeiros et al. [64], teachers who deliver prevention programs feel overburdened by program activities, which require planning and classroom preparation which consequently affects their regular curricular activities. Thus, implementation of a school-based program by outside individuals is likely to be a positive experience for teachers and for the school itself. Although PROERD is delivered by police officers, the interviews show that these instructors are equally burdened by this

role, as they continue to perform other policing functions. Given the importance of implementation quality [33], developers must focus on program viability to ensure that the required activities do not overburden instructors (from inside or outside the school setting) and compromise its quality [64].

In analyzing the interviews, it became evident that the null effect of implementation fidelity lies on the lack of cultural adaptation, as officers reported having to adapt the program to make implementation feasible due to student difficulties and school infrastructure.

Limitations

A first limitation to consider is that the schools selected to participate in the RCTs were located in the low-income regions of São Paulo, which experience high exposure to drug use [65]; hence, instructors working in different areas could have distinct experiences and perceptions regarding the program. Since our sample consisted of schools that did not receive any intervention in the three years prior to the study to ensure non-contamination, the data cannot be generalized to all schools in São Paulo. Another limitation concerns the fidelity forms, which were subject to information bias due to self-reporting [29]. Moreover, both the questionnaire and fidelity forms were measured by dichotomous answers, limiting the analysis. One final limitation is that we didn't use school achievement and other important predictors of drug use, such as mental health, family environment and drug access as control variables, which have strong predictive power for substance use.

Conclusion

This study is the first to evaluate PROERD implementation fidelity in Brazil, highlighting important considerations to improve is effectiveness and sustainability. Future studies examining these parameters should employ better reliable instruments to measure implementation fidelity (dosage and quality), such as class observations. Moreover, future PROERD investigations must define which activity touches upon the core element of a lesson [61]. PROERD instructors with a clear understanding of the essential elements to be taught is key, allowing them to adapt less important parts in a structured manner according to the audience. Given the country's territorial extent and its different realities, PROERD curricula must undergo a process of cultural adaptation. Moreover, the Military Police should incorporate the scientific findings regarding PROERD implementation in São Paulo and continue to investigate its effects not only in the city, but throughout the country.

List of Abbreviations

ABEP	Brazilian Association of Research Companies.
cRCT	Cluster Randomized Controlled Trial.
DARE-kiR	DARE-Keepin'it REAL.
EU-DAP	European Drug Addiction Prevention Trial.
kiR	Keepin' it REAL.
OECD	Organization for Economic Cooperation and Development.
PENSE	National Survey of School Health.
PROERD	Drug and Violence Resistance Educational Program (*Programa Educacional de Resistência às Drogas e à Violência)*.
RCT	Randomized Control Trial.
SES	Socioeconomic Status.
WHO	World Health Organization.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s13011-022-00496-w.

Supplementary Material 1

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Authors' Contributions:

J.D., R.G., J.Y., I.P., and Z.M. wrote the manuscript. J.D. and R.G. prepared the figures. J.D. and J.Y. prepared the tables. All authors reviewed the manuscript.

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Data Availability

Data and materials are available upon request.

Declarations

Ethics Approval

All procedures in the present study followed the ethical standards established by institutional and/or national research committees and the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Study registered in the Brazilian Ministry of Health Register of Clinical Trials (REBEC) under protocol no. 6q23nk (https://ensaiosclinicos.gov.br/rg/RBR-6q23nk). Study protocol was approved by the Research Ethics Committee of the Universidade Federal de São Paulo (No.1327/2018).

Consent to Participate

All participants gave informed consent to participate in the study.

Consent for Publication

Not applicable.

Conflict of Interest

None.

Trial Registration

Study registered in the Brazilian Ministry of Health Register of Clinical Trials (REBEC) under protocol no. 6q23nk.

Completeness

N = times when lesson activities were delivered. % = activities completed in each class.

Alteration

N = times when lesson activities were altered. % = activities altered in each class.

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References

1. Bates MLS, Trujillo KA. Use and abuse of dissociative and psychedelic drugs in adolescence. Pharmacol Biochem Behav [Internet]. 2021;203:173129. Available from: https://doi.org/10.1016/j.pbb.2021.173129.
2. Wittchen HU, Fröhlich C, Behrendt S, Günther A, Rehm J, Zimmermann P, et al. Cannabis use and cannabis use disorders and their relationship to mental disorders: A 10-year prospective-longitudinal community study in adolescents. Drug Alcohol Depend. 2007;88(SUPPL.1):60–70.
3. Kim MJ, Mason WA, Herrenkohl TI, Catalano RF, Toumbourou JW, Hemphill SA. Influence of Early Onset of Alcohol Use on the Development of Adolescent Alcohol Problems: a Longitudinal Binational Study. Prev Sci [Internet]. 2017;18(1). Available from: https://doi.org/10.1007/s11121-016-0710-z.
4. Hingson RW, Heeren T, Winter MR. Age at drinking onset and alcohol dependence: Age at onset, duration, and severity. Arch Pediatr Adolesc Med. 2006;160(7):739–46.
5. Hall WD, Patton G, Stockings E, Weier M, Lynskey M, Morley KI, et al. Why young people's substance use matters for global health. The Lancet Psychiatry [Internet]. 2016;3(3):265–79. Available from: https://doi.org/10.1016/S2215-0366(16)00013-4.
6. Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, et al. Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. Lancet. 2013 Nov;382(9904):1575–86.
7. IBGE - Instituto Brasileiro de Geografia e Estatística. Pesquisa Nacional de Saúde do Escolar 2015. Rio de Janeiro; 2016.
8. Pereira APD, Sanchez ZM. Characteristics of school-based drug prevention programs in Brazil. Cienc e Saude Coletiva. 2020;25(8):3131–42.
9. Sanchez ZM, Valente JY, Gusmões JDP, Ferreira-Junior V, Caetano SC, Cogo-Moreira H, et al. Effectiveness of a school-based substance use prevention program taught by police officers in Brazil: Two cluster randomized controlled trials of the PROERD. Int J Drug Policy [Internet]. 2021;98:103413. Available from: https://doi.org/10.1016/j.drugpo.2021.103413.
10. Valente JY, Sanchez ZM. Short – Term Secondary Effects of a School – Based Drug Prevention Program: Cluster – Randomized Controlled Trial of the Brazilian Version of DARE ' s Keepin ' it REAL. Prev Sci [Internet]. 2021;(0123456789). Available from: https://doi.org/10.1007/s11121-021-01277-w.
11. Day LE, Miller-Day M, Hecht ML, Fehmie D. Coming to the new D.A.R.E.: A preliminary test of the officer-taught elementary keepin' it REAL curriculum. Addict Behav [Internet]. 2017;74(November 2016):67–73. Available from: https://doi.org/10.1016/j.addbeh.2017.05.025.
12. Caputi TL, Thomas McLellan A, Truth and D.A.R.E.: Is D.A.R.E.'s new Keepin' it REAL curriculum suitable for American nationwide implementation? Drugs Educ Prev Policy [Internet]. 2017;24(1):49–57. Available from: https://doi.org/10.1080/09687637.2016.1208731.
13. Hecht ML, Marsiglia FF, Elek E, Wagstaff DA, Kulis S, Dustman P, et al. Culturally Grounded Substance Use Prevention: An Evaluation of the keepin' it R.E.A.L. Curriculum Michael. Prev Sci. 2003;4(4):233–48.
14. Kulis SS, Marsiglia FF, Porta M, Arévalo Avalos MR, Ayers SL. Testing the keepin' it REAL Substance Use Prevention Curriculum Among Early Adolescents in Guatemala City. Prev Sci. 2019 May;20(4):532–43.
15. Kulis SS, Marsiglia FF, Medina-Mora ME, Nuño-Gutiérrez BL, Corona MD, Ayers SL. Keepin' It REAL—Mantente REAL in Mexico: a Cluster Randomized Controlled Trial of a Culturally Adapted Substance Use Prevention Curriculum for Early Adolescents. Prev Sci [Internet]. 2021;22(5):645–57. Available from: https://doi.org/10.1007/s11121-021-01217-8.
16. Hecht ML, Shin Y, Pettigrew J, Miller-Day M, Krieger JL. Designed Cultural Adaptation and Delivery Quality in Rural Substance Use Prevention: an Effectiveness Trial for the Keepin' it REAL Curriculum. Prev Sci. 2018 Nov;19(8):1008–18.
17. Cutrín O, Kulis S, Maneiro L, MacFadden I, Navas MP, Alarcón D, et al. Effectiveness of the Mantente REAL Program for Preventing Alcohol Use in Spanish Adolescents. Psychosoc Interv [Internet]. 2021;30(3):113–22. Available from: https://doi.org/10.5093/pi2020a19.
18. Marsiglia FF, Kulis S, Yabiku ST, Nieri TA, Coleman E. When to Intervene: Elementary School, Middle School or Both ? Effects of keepin ' It REAL on Substance Use Trajectories of Mexican Heritage Youth. 2011;48–62.
19. Elek E, Wagstaff DA, Hecht ML. Effects of the 5th and 7th Grade Enhanced Versions of the Keepin' it Real Substance Use Prevention Curriculum. J Drug Educ. 2010;40(1):61–79.
20. Kulis S, Nieri T, Yabiku S, Stromwall LK, Marsiglia FF. Promoting reduced and discontinued substance use among adolescent substance users: Effectiveness of a universal prevention program. Prev Sci. 2007;8(1):35–49.
21. Marsiglia FF, Booth JM, Ayers SL, Nuño-Gutierrez BL, Kulis S, Hoffman S. Short-Term Effects on Substance Use of the Keepin' It REAL Pilot Prevention Program: Linguistically Adapted for Youth in Jalisco, Mexico. Prev Sci. 2014;15(5):694–704.
22. Kulis SS, Garcia-Perez H, Marsiglia FF, Ayers SL. Testing a Culturally Adapted Youth Substance Use Prevention Program in a Mexican Border City: Mantente REAL. Subst Use Misuse [Internet]. 2020;56(2):245–57. Available from: https://doi.org/10.1080/10826084.2020.1858103.
23. Marsiglia FF, Medina-Mora ME, Gonzalvez A, Alderson G, Harthun M, Ayers S, et al. Binational Cultural Adaptation of the keepin' it REAL Substance Use Prevention Program for Adolescents in Mexico. Prev Sci. 2019;20(7):1125–35.
24. Marsiglia FF, Kulis SS, Cutrín O, Medina-Mora ME, Real T, Nuño-Gutiérrez BL, et al. The feasibility, acceptability, and utility of Mantente REAL: The culturally adapted version of keepin' it REAL for Mexico. Prev Sci [Internet]. 2022; Available from: https://doi.org/10.1007/s11121-022-01409-w.
25. Pettigrew J, Graham JW, Miller-Day M, Hecht ML, Krieger JL, Shin YJ. Adherence and delivery: Implementation quality and program outcomes for the 7th grade keepin' it REAL program. Prev Sci [Internet]. 2015;16(1):90–9. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3624763/pdf/nihms412728.pdf.
26. Keller-margulis MA. Fidelity of implementation framework: a critical need for response to intervention models. 2012;49(4):342–52.
27. McDavid JC, Huse I, Hawthorn LR. Program evaluation and performance measurement: An introduction to practice. Sage Publications; 2018.
28. Yeaton WH, Sechrest L. Critical Dimensions in the Choice and Maintenance of Successful Treatments: Strength. Integr Eff. 1981;49(2):156–67.
29. Dusenbury L, Brannigan R, Falco M, Hansen WB. A review of research on fidelity of implementation: implications for drug abuse prevention in school settings. 2003;18(2):237–56.
30. Hill HC, Erickson A. Using Implementation Fidelity to Aid in Interpreting Program Impacts: A Brief Review. Educ Res. 2019;48(9):590–8.
31. Pettigrew J, Miller-Day M, Shin YJ, Hecht ML, Krieger JL, Graham JW. Describing Teacher-Student Interactions: A Qualitative Assessment of Teacher Implementation of the 7th Grade keepin' it REAL Substance Use Intervention. Am J Community Psychol. 2013;51(1–2):43–56.
32. Stirman SW, Miller CJ, Toder K, Calloway A. Development of a framework and coding system for modifications and adaptations of evidence-based interventions. Implement Sci. 2013;8(1):1–12.
33. Harn B, Parisi D, Stoolmiller M. Balancing Fidelity With Flexibility and Fit: What DoWe Really Know About Fidelity of Implementation in Schools? 2013;79(2):181–93.
34. Sanetti LMH, Collier-Meek MA, Fallon LM. Fidelity with flexibility: Treatment acceptability and individualized adaptations of evidence-supported treatments. In: The Oxford handbook of treatment processes and outcomes in psychology: A multidisciplinary, biopsychosocial approach. Oxford University Press; 2016. pp. 289–308.
35. Kulis SS, Marsiglia FF, Porta M, Arévalo Avalos MR, Ayers SL. Testing the keepin' it REAL Substance Use Prevention Curriculum Among Early Adolescents in Guatemala City. Prev Sci. 2018;20(4):532–43.
36. Creswell JW, Clark VLP. Designing and Conducting Mixed Methods Research. Thousand Oaks: Sage; 2006. 520 p.
37. Miller-Day M, Hecht ML. Narrative Means to Preventative Ends: A Narrative Engagement Framework for Designing Prevention Interventions. Health Commun. 2013;28(7):657–70.
38. Hecht ML, Krieger JLR. The principle of cultural grounding in school-based substance abuse prevention: The drug resistance strategies project. J Lang Soc Psychol. 2006;25(3):301–19.
39. Botvin GJ. Substance Abuse Prevention Research. Recent Developments and Future Directions. J Sch Health. 1986;56(9):369–74.
40. Cialdini RB, Reno RR, Kallgren CA. A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. J Pers Soc Psychol. 1990;58(6):1015–26.
41. Sanchez ZM, Valente JY, Sanudo A, Pereira APD, Cruz JI, Schneider D, et al. The #Tamojunto Drug Prevention Program in Brazilian Schools: a Randomized Controlled Trial. Prev Sci. 2017;18(7):772–82.
42. Sanchez ZM, Valente JY, Galvão PP, Gubert FA, Melo MHS, Caetano SC, et al. A cluster randomized controlled trial evaluating the effectiveness of the school-based drug prevention program #Tamojunto2.0. Addiction. 2021;116(6):1580–92.
43. Faggiano F, Vigna-Taglianti F, Burkhart G, Bohrn K, Cuomo L, Gregori D, et al. The effectiveness of a school-based substance abuse prevention program:

18-Month follow-up of the EU-Dap cluster randomized controlled trial. Drug Alcohol Depend. 2010;108(1–2):56–64.
44. Carlini EL, de A, Noto, Carlini AR, CM de A, Locatelli, Abeid DP, LR, Amato T de C, et al. VI Levantamento Nacional sobre o Consumo de Drogas Psicotrópicas entre Estudantes do Ensino Fundamental e Médio das Redes Publica e Privada de Ensino nas 27 Capitais Brasileiras. 2010.
45. IBGE -. Instituto Brasileiro de Geografia e Estatística. Pesquisa Nacional de Saúde do Escolar 2015. 2016.
46. ABEP AB de E de P-. Critério de Classificação Econômica do Brasil [Criteria for Economic Classification in Brazil] [Internet]. 2012. Available from: http://www.abep.org/criterio-brasil.
47. Valente JY, Cogo-Moreira H, Swardfager W, Sanchez ZM. A latent transition analysis of a cluster randomized controlled trial for drug use prevention. J Consult Clin Psychol [Internet]. 2018 Aug;86(8):657–65. Available from: http://doi.apa.org/getdoi.cfm?doi=10.1037/ccp0000329.
48. Who - World Health Organization. Qualitative research for health programmes. 1994. p. 99.
49. Patton MQ. Qualitative research and evaluation methods. 3rd Editio. Thousand Oaks: Sage Publications; 2002.
50. Beroho M, Briak H, El Halimi R, Ouallali A, Boulahfa I, Mrabet R, et al. Analysis and prediction of climate forecasts in Northern Morocco: application of multilevel linear mixed effects models using R software. Heliyon [Internet]. 2020;6(10):e05094. Available from: https://doi.org/10.1016/j.heliyon.2020.e05094.
51. Pinheiro JC, Bates DM. Mixed-Effects Models in S and S-PLUS. Springer; 2000.
52. Fereday J, Muir-Cochrane E. Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. Int J Qual Methods. 2006;5(1).
53. Strauss A, Corbin J. Bases de la investigación cualitativa - técnicas y procedimientos para desarrollar la teoría fundamentada. 2012.
54. Kim JS. Making Every Study Count: Learning From Replication Failure to Improve Intervention Research. Educ Res. 2019;48(9):599–607.
55. Jacob RT, Doolittle F, Kemple J, Somers MA. A Framework for Learning From Null Results. Educ Res. 2019;48(9):580–9.
56. Castro FG, Barrera M, Martinez CR. The Cultural Adaptation of Prevention Interventions: Resolving Tensions Between Fidelity and Fit. Prev Sci. 2004;5(1):41–5.
57. Parson S, Davis S, Scales R, Williams JB, Kear K. How and Why Teachers Adapt Their Literacy Instruction. English. 2010. p. 235.
58. Odom SL, Fleming K, Diamond K, Lieber J, Hanson M, Butera G, et al. Examining different forms of implementation and in early childhood curriculum research. Early Child Res Q [Internet]. 2010;25(3):314–28. Available from: https://doi.org/10.1016/j.ecresq.2010.03.001.
59. Creswell JW. Research Design - Qualitative, Quantitative, and Mixed Methods Approaches. 4th ed.: SAGE; 2014.
60. Ringwalt CL, Vincus A, Ennett S, Johnson R, Rohrbach LA. Reasons for teachers' adaptation of substance use prevention curricula in schools with non-white student populations. Prev Sci. 2004;5(1):61–7.
61. Miller-Day M, Pettigrew J, Hecht ML, Shin YJ, Graham J, Krieger J. How prevention curricula are taught under real-world conditions: Types of and reasons for teacher curriculum adaptations. Health Educ. 2013;113(4):324–44.
62. Center BNI. TIC EDUCAÇÃO - Pesquisa Sobre o Uso das Tecnologias de Informação e Comunicação nas Escolas Brasileiras 2018 [Internet]. Pesquisa sobre o uso das tecnologias de informação e comunicação na escolas brasileiras: TIC educação 2018. Núcleo de Informação e Coordenação do Ponto BR e Comitê Gestor da Internet no Brasil. 2019. Available from: https://cetic.br/media/docs/publicacoes/216410120191105/tic_edu_2018_livro_eletronico.pdf.
63. Warren JR, Hecht ML, Wagstaff DA, Elek E, Ndiaye K, Dustman P, et al. Communicating Prevention: The Effects of the keepin' it REAL Classroom Videotapes and Televised PSAs on Middle-School Students' Substance Use. J Appl Commun Res. 2006 May;34(2):209–27.
64. Medeiros PFP, Cruz JI, Schneider D, Sanudo A, Sanchez ZM. Process evaluation of the implementation of the Unplugged Program for drug use prevention in Brazilian schools. Subst Abus Treat Prev Policy [Internet]. 2016;11(1):1–11. Available from: https://doi.org/10.1186/s13011-015-0047-9.
65. Daniel JZ, Hickman M, Macleod J, Wiles N, Lingford-Hughes A, Farrell M, et al. Is socioeconomic status in early life associated with drug use? A systematic review of the evidence. Drug Alcohol Rev. 2009;28(2):142–53.

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