

RESEARCH

Open Access



Preventing gambling-related harm among adolescents (PRoGRAM-A): an embedded multi-modal process evaluation in a pilot cluster random control trial

Martine Miller^{1*} , Freya Howell¹ , James White² , Dave Griffiths³ , Leon Noble⁴ , Christopher J. Weir⁵ , Angela Niven¹ , Andrew Stoddart⁵ , Hanna Ensor⁵ , Heather Wardle⁶ , Richard Purves⁷ and Fiona Dobbie¹

Abstract

Background and Aims Young people's engagement in gambling can be linked to gambling-related harm. This can cause stress, anxiety, relationship issues, debt, and lost opportunities. There is a lack of independently funded, and evidence-based school-based interventions that seek to prevent and reduce the harms associated with gambling. PRoGRAM-A is one of the first independently research funded interventions to prevent gambling related harm in adolescents. This paper presents findings from an embedded process evaluation of the pilot cluster randomised control trial of PRoGRAM-A, with a specific focus on intervention fidelity, feasibility and acceptability.

Method Multi-modal study design comprised of qualitative focus groups with students ($N=42$); and individual interviews with teachers ($N=7$), PRoGRAM-A trainers ($N=5$), student friends and family ($N=2$) and stakeholders ($N=8$). Structured Observations of the full cycle of PRoGRAM-A across two intervention schools were also undertaken.

Results PRoGRAM-A was delivered with a high degree of fidelity (95%) to the training manual. It was also found to be both feasible and acceptable to students, staff and parents. It was appealing to schools as it allowed teachers to address the topic of gambling, which had already been flagged as an issue for some of the schools, but they lacked the skill and capacity to take action. Peer Supporters enjoyed the interactive nature of the training workshop. Parents and carers were supportive of the intervention and stakeholders recognised the growing need for a non-industry funded school-based intervention to raise awareness among students of gambling and gambling-related harm (GRH). Suggested intervention refinements include embedding examples of lived experience to aid students' engagement with the topic of gambling and GRH. Increasing social skills activities to ensure students are comfortable and confident when initiating conversations and making follow-up sessions more interactive (in-line with the two-day workshop).

*Correspondence:
Martine Miller
martine.miller@ed.ac.uk

Full list of author information is available at the end of the article



© The Author(s) 2025. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

Conclusions This study demonstrated that it is feasible and acceptable to deliver the PRoGRAM-A gambling harm reduction intervention within secondary schools with a high degree of fidelity. Addressing the topic of gambling and GRH within the school curriculum was deemed to be acceptable by all sample groups, including students.

Trial registration Research Registry researchregistry8699.

Keywords School-based intervention, Peer education, Gambling, Gambling related harm, Young people, Public health.

Background

Gambling is a highly profitable commercial activity. In 2023 to 2024, the revenue for the UK gambling industry was £15.56 billion, with £6.9 billion lost by online gamblers [1]. The global digital revolution has transformed the gambling market, increasing accessibility and generating more opportunities to gamble. This, in conjunction with sophisticated and prevalent marketing, has resulted in the normalisation of gambling and an incumbent rise in gambling-related harm (GRH) [2]. The term GRH captures the negative impact of gambling holistically and is used to describe the detriments to health and wellbeing of an individual, their family, community or society [3].

Research observing young people's participation in gambling has indicated its adverse impact on children's mental and physical health, emotional and academic development, relationships, and finances, the implications of which may be carried from childhood into later life [4]. As a result, many countries including the UK restrict most forms of commercial gambling until the age of 18, with gambling now recognised as a public health concern [5, 6].

Despite age restrictions being in place, young people remain at risk of GRH. In 2024, 11-17-year-olds in the UK were more likely to report having spent their own money on a gambling activity in the last 12 months (27%) than vaping (15%), smoking a cigarette (8%) or taking illegal drugs (7%) [4]. Moreover, as prevalence estimates do not include popular "gambling-adjacent" activities such as loot boxes within video games which may involve wagering real currency for virtual rewards, they are unlikely to reflect the full extent of the issue [7].

Persistent exposure to gambling-related advertising, alongside the rise of online gambling, and the use of gambling-features in video-games has supported the rising normalisation of gambling amongst young people in the UK [8]. A recent systematic review of GRH prevention interventions identified children and adolescents as a key priority groups [9]. To respond to this need requires access to evidence-based and theoretically informed gambling prevention programmes for children and adolescents, rather than accepting educational programmes with industry involvement, which have historically dominated the field [10]. PRoGRAM-A is one of the first

independently research funded interventions to prevent gambling harm in adolescence.

To determine if a future phase III cluster randomised control trial (cRCT) was warranted, PRoGRAM-A was piloted in an 18 month, two-arm, cluster randomised control trial in six secondary schools (four intervention and two control) in Scotland [2]. Following the MRC guidelines for process evaluations of complex interventions, a multi-modal process evaluation was embedded within the pilot [11]. This paper presents findings from the process evaluation, with a specific focus on intervention fidelity, feasibility, acceptability and areas to optimise future delivery and evaluation of PRoGRAM-A.

PRoGRAM-A intervention

PRoGRAM-A (Preventing Gambling Related Harm in Adolescence) aims to prevent gambling-related harm in adolescence. It is a novel peer-led, social network intervention grounded in diffusion and network intervention theory [12, 13]. Secondary school students aged 13–15 were asked to nominate opinion leaders within their year group, to become a 'Peer Supporter'. This required students across an entire year group (aged 13–15 year-olds) to complete the following questions: 'who do you respect'; 'who are good leaders in sports and other group activities'; and 'who do you look up to'. For each question, students were asked to list up to five fellow students within their year group. The key purpose of the nomination form was for students (not teaching staff) to identify students of influence. Students receiving the most nominations (18%) were invited to become Peer Supporters and take part in a two-day gambling education training programme. Training was delivered by youth workers to Peer Supporters using fun and engaging activities, centred on four key topics: what is gambling; gambling and gaming; gambling marketing; and gambling harm. They were then encouraged to initiate conversations about gambling harm with their peers, friends and family networks, using communication styles they judged to be most appropriate. Full intervention description is found in the supplementary files (see Table 1) using the 'Template for Intervention Design and Replication' (TIDiER) [14] and logic model for the PRoGRAM-A intervention (Fig. 1).

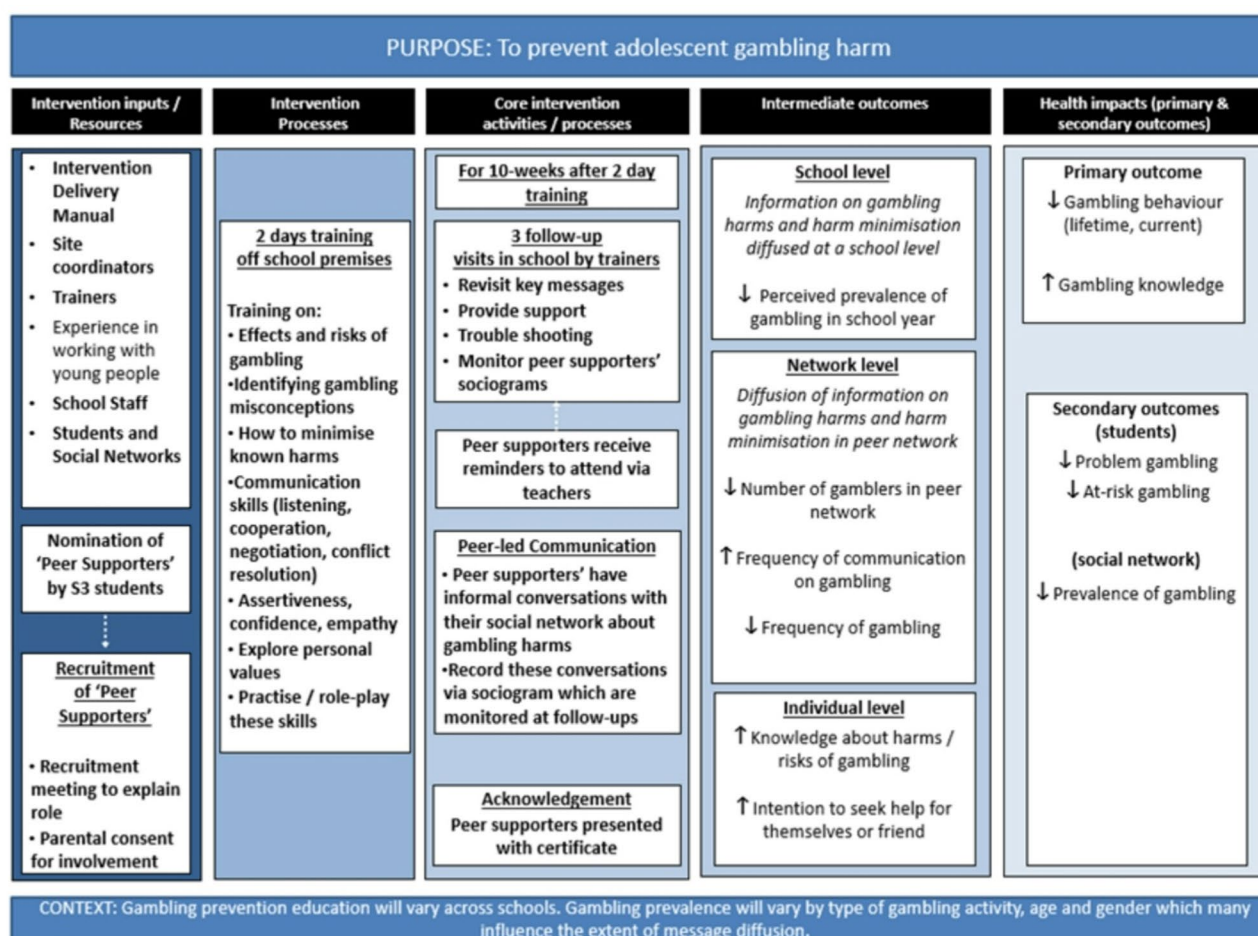


Fig. 1 PRoGRAM-A logic model

Methods

A pilot cluster Random Control Trial (RCT) of PRoGRAM-A commenced in March 2023. As part of the pilot cluster RCT of PRoGRAM-A, an embedded multi-modal process evaluation ran parallel to the delivery of PRoGRAM-A intervention. The process evaluation was conducted between January and October 2024. The aim of the process evaluation was to assess intervention fidelity, feasibility and acceptability to multiple stakeholder groups. In addition to qualitative consultation with five key stakeholder groups (see Table 1), structured observations of one full cycle of the PRoGRAM-A delivery were conducted in two intervention schools. Fieldwork was undertaken by MM, LN, AN and FD.

Ethics and informed consent

Ethical approval was granted by The University of Edinburgh Medical Research Ethics Committee (Ref-23 EMREC-016), on 9th August 2023, along with Local Authority approval for all six schools. Final approval was obtained from the head teacher at each school. All study participants provided informed consent. Parents

or guardians of all participating minors were informed about the study via an information leaflet distributed by the school. If they wished to withdraw their child/children from the research they completed an opt-out form. Informed consent was therefore considered given unless an opt-out form was received. Students gave written student assent prior to fieldwork.

Participants were provided with information sheets about the process evaluation in advance of taking part in interviews or focus group discussions. Verbal consent was taken by the researcher conducting online/telephone interviews with teachers, stakeholders, Peer Supporter family members and PRoGRAM-A trainers. In the case of focus group discussions with students, the PRoGRAM-A lead teacher provided students with information leaflets about the process evaluation focus group discussions one week in advance of the researchers attending school. On the day of the focus groups, written student assent was obtained. Interview and focus group discussions were recorded using encrypted digital voice recorders and transcribed non-verbatim by an in-house transcriber within the University of Edinburgh.

Table 1 Participant group, research method and achieved sample

Participant group	Research method	Key topics covered	Intervention Schools (N = 4)	Control Schools (N = 2)
Teaching Staff	Observations	Fidelity/adherence to the training manual.	N = 2	n/a
	Individual semi-structured telephone/ TEAMS online interview	Acceptability and feasibility of intervention; mechanisms of change.	N = 5	N = 2
*Peer Supporters	Focus group discussion	Acceptability and feasibility of intervention; mechanisms of change.	5 focus groups (3 mixed groups and 2 single sex groups) N = 25 students	n/a
**Non-Peer Supporters	Focus group discussion	Acceptability and feasibility of intervention; mechanisms of change.	3 focus groups (3 mixed groups) N = 17 students	n/a
Friends & family	Individual semi-structured telephone interview	Acceptability and feasibility of intervention; mechanisms of change.	N = 2 (parents)	n/a

*Peer Supporters are those nominated by the peers as being influential, based upon three questions (see PRoGRAM-A intervention description above)

** Non-Peer Supporters are students within the year group who took part in a focus group

Semi-structured topic guides were created for students, parents and carers, teachers, PRoGRAM-A trainers and stakeholders (see supplementary documents).

Data collection

To assess delivery fidelity of the PRoGRAM-A training manual, in person observation of one complete cycle of PRoGRAM-A was conducted in two schools. An observation codebook allowed observers to record written qualitative notes. The aim of the observations were two-fold. First, it was an opportunity for the research team to track any issues with the content of the PRoGRAM-A manual. Specifically, the team were interested in observing how the materials were received and understood by the Peer Supporters. Second, was to observe PRoGRAM-A trainers' adherence to the PRoGRAM-A training manual when delivering the training workshops and follow-up sessions to assess the fidelity of delivery.

In addition to structured observations, semi-structure interviews and focus group discussions were undertaken by members of the research team (MM, LN and FD) with students (5 focus groups, N = 25 students), teachers (N = 7), friends and family of Peer Supporters (N = 2) (see Table 1 below). Semi-structured interviews were also conducted with stakeholders (N = 8) and PRoGRAM-A trainers (N = 5). Interview guides sought to explore each participant group's views on all aspects of the delivery of the PRoGRAM-A intervention, which included trainer PRoGRAM-A training, peer nomination process for Peer Supporters, Peer Supporter training and engagement with the role of Peer Supporter. Interview guides also explored the perceived acceptability of addressing the topic of gambling and GRH within the school curriculum. All interviews and focus groups were recorded using encrypted digital recorders (Olympus DS-9000) and audio files transcribed and anonymised. Pseudonyms were applied to focus group transcripts.

Table 1 below shows details of school staff, students and Peer Supporters' parents & carers involved in each element of the process evaluation and associated methodological information.

In addition to the participant groups listed in Table 1 above, individual semi-structured interviews were conducted with stakeholders who occupied strategic-level positions across public health, education, and policy sectors (N = 8) and PRoGRAM-A trainers (N = 5).

Sampling and recruitment

Scottish secondary schools were invited to attend an online webinar to find out about PRoGRAM-A and what taking part in the RCT would involve. Dissemination of the webinar event was cascaded through the research team's professional and partner networks. Those interested schools, then got in touch directly with the study PI (FD) to express their willingness to participate. Schools that opted in to PRoGRAM-A were then registered into the pilot cluster randomised control trial (cRCT) (see [2] for further details on sampling and recruitment). A total of six schools (4 intervention and 2 control) participated in the pilot cRCT.

Teachers were invited to take part in a short telephone or online TEAMS interview via an email prepared by the research team, and circulated by the lead contact for each school that was registered to take part in the PRoGRAM-A Trial (both control and intervention schools). Interested staff members then contacted the research team directly to arrange a convenient time to conduct an interview. Teachers were offered the option of taking part in an individual or paired interview. In one participating school, teachers opted to participate in a paired interview. Students (Peer and Non-Peer supporters) were invited to participate in focus group discussions by their school's PRoGRAM-A lead teacher. Lead teachers helped to identify and co-ordinate students who were interested in taking part in discussions with the research team (MM,

FD & LN). Discussion groups took place in a classroom during one class period. Professional stakeholders were recruited using a mixture of opportunity and snowball sampling methods. Stakeholders were initially identified through our research team's professional networks, and also at the point of interview, where researchers asked each participant for further recommendations of professionals to include in our sample. Stakeholders included strategic-level professionals across the UK within public health, government and education. Once identified, stakeholders were invited via email to participate in a short telephone or online TEAMS interview. A study information sheet and consent form were also included in this initial email. Lastly, PRoGRAM-A trainers were invited to take part in a telephone or online TEAMS interview to discuss the delivery of the PRoGRAM-A intervention. All sample groups were given an opportunity to ask questions about the study before consenting to take part in interviews or focus group discussions.

Analysis

Three members of the research team were involved in the creation and testing of thematic coding frameworks for each sample type (MM, LN and FH). Researchers tested the coding frameworks on a sample of transcripts, then met to discuss and resolve any coding discrepancies before finalising the coding framework for each sample type. Transcripts were then uploaded into NVivo 14. Once coding was complete, an inductive, thematic analysis was conducted [15] to capture participants' views relating specifically to the acceptability and feasibility of PRoGRAM-A.

Results

The following four themes explored intervention acceptability and feasibility and identified learning to optimise future delivery of PRoGRAM-A: topic relevance; mode of delivery; co-ordination and delivery; future intentions. However, before discussing themes associated with acceptability and feasibility, fidelity of the intervention is considered.

Fidelity to the manual

Structured observations of a complete cycle of the PRoGRAM-A delivery were conducted by the research team (MM, FD, AN and LN) in two intervention schools. From these observations, PRoGRAM-A trainer's adherence to the delivery of the training manual in two-day training workshop and follow-up sessions were assessed. Adherence was assessed in terms of successful delivery of the four topics; students' engagement with the topics; suitability of the venues and staffing numbers. All topics within the training manual were compulsory. Based upon review of the observation code books, we concluded that

all topic activities were delivered as intended. However, due to a delivery deviation noted for one of the follow-up sessions, where one PRoGRAM-A trainer was present as opposed to two, we report 95% adherence to the intervention delivery (see [16] for fuller details).

Topic relevance

A common view from stakeholder groups was that the topic of gambling and GRH was both appropriate and acceptable to address with young people within the secondary school setting. Teachers reported that gambling was not a topic routinely covered within the school curriculum, noting that student's past work on the topic had been 'ad-hoc' and typically delivered to senior year groups (students aged 16 years or older). School involvement in PRoGRAM-A, thus enabled them to address a current gap within their curriculum.

Stakeholders working across the fields of public health, policy and education were equally in favour of addressing the topic of gambling and GRH within the school curriculum, again reinforcing the acceptability of PRoGRAM-A. These stakeholders also called for earlier dissemination of gambling preventative messaging to younger students and raising critical awareness of the many activities which constitute gambling. This was particularly salient when stakeholders discussed the intersection of gambling and gaming among young people and other gambling adjacent behaviours. While it was recognised that younger students may not perceive gambling harm as relevant to them, the importance of early messaging to preventing future engagement in gambling and GRH was recognised by teachers, PRoGRAM-A Trainers and stakeholders. Indeed, the practice of early preventative messaging was noted to exist for other topics such as sexual health, vaping and tobacco, alcohol and drug misuse, and digital harm. The view was therefore that early preventative messaging should be extended to address gambling and GRH.

... it's interesting, like thinking about the age group, this is a group of people that aren't legally permitted to gamble and shouldn't be exposed to gambling advertising, gambling products, but they are. And I think it's important, you know, just the same as you'd equip and teach, talk to people about alcohol or smoking or other things. I think children and young people are targeted by gambling industries... there's a real kind of heavy recruitment that seems to go on in terms of getting [young] people... So it's giving [young] people the knowledge and skills before that happens, to understand about it. So yeah, I think it's very important to do that.

Stakeholder ID1.

While initial discussions with students tended not to frame gambling as being particularly salient, when asked about their knowledge and awareness of gambling, gambling institutions/companies, gambling advertising and marketing, both Peer and Non-Peer Supporters were able to draw upon their exposure to gambling content and advertising/marketing within their local communities and online environments, resulting in them having lots to contribute to focus group discussions:

There's a lot of like the betting shops in town and even just in [Name of Town] there's so many of them. So even just walking down a street you'll see some sort of ad for it or just an actual betting place.
Noel, Peer Supporter (FG2), School 4, Intervention.

Despite initial reservations about the topic of gambling and GRH, when asked why students agreed to take on the role of Peer Supporter, students reported being keen to learn more about the topic, which was captured in the focus group discussion below with Peer Supporters:

*Interviewer: Can you tell me a little bit about why you decided to take on the role [of Peer Supporter]?
Connie: I just thought it would be interesting, like learning about it and stuff.
Interviewer: So what did you think would be interesting, like the topic itself or...?
Connie: Yeah, just learning all about it.
Interviewer: OK. Anybody else?
Alasdair: I thought it would be quite interesting to be in a pilot for a programme like this and be able to share my opinion, and also learn the topic because the topic's really interesting and influential.*
FG1, Peer Supporters, School 3, Intervention.

The readiness of students to discuss their day-to-day exposure to gambling marketing and advertising, coupled with their eagerness to learn more about the topic of gambling and GRH through becoming a Peer Supporter illustrated their support for acceptability of the topic being addressed within their school curriculum.

While teachers were supportive of addressing gambling and GRHs within the school curriculum, some felt they did not have the time or capacity to fully engage with the subject to allow them to confidently develop the topic within the current curriculum. PRoGRAM-A was therefore reported to be an attractive educational resource that was not only considered to be relevant and up-to-date, but also evidence based. When asked about the attractiveness of PRoGRAM-A as an educational intervention, one teacher commented:

well, the two things, up to date and it's also something that I'm very aware that the programme we have does not do enough [on topic of gambling and GRH]. So it's something, if you think of how much gambling affects the majority of people's lives in one way or another and how almost accepted it is until it's too late, I think anything that increases that awareness has to be useful. And it's how do we fit it in with everything else we're expected to [deliver] but it's about certain priorities need to shift.
Teacher 1, School 1, Control.

Among stakeholders, acceptability of the PRoGRAM-A intervention was also discussed in relation to its impartiality, with no gambling industry influence.

I would say we should have no industry-sponsored education programmes in this country and that's what we should be aiming for... So both in terms of research and in terms of delivery, I'd be saying no industry-sponsored education programmes.
Stakeholder 4.

Mode of delivery

External trainers to deliver PRoGRAM-A

In addition to commenting on the robust development and evaluation of the PRoGRAM-A resources, and relevance of the materials for young people aged 13 to 15, teachers also appreciated the opportunity to collaborate with external agencies who “bring topics to life” (Teacher 1, Control School) for students. This view was similarly echoed by Peer Supporters’ family members, with one father noting:

I think it's a good idea [external trainers], it's the right way to do it. I mean, I think if you got a teacher stood up doing it, it probably wouldn't land well. If you had an expert come in, like into the school, or somebody who had a gambling story to tell, like you know “I've been here and I've experienced what it can do” sort of thing. That sort of story and that way of relaying the message, I would say that would get across quite well. Because people automatically sort of buy into that when they've got someone stood in front of them who isn't a teacher.
Peer Supporter Father, A1, School 4, Intervention.

Similar to teaching staff, stakeholders broadly supported the mode of delivery of PRoGRAM-A, recognising that the combination of external trainers (youth workers) alongside a peer-to-peer education model had the potential to increase the relevance of the topic for young people. They also noted that delivery by someone external

to the school (i.e., not a teacher) may help destigmatise gambling conversations and result in greater engagement with the topic. Family members were equally supportive of promoting diverse learning styles within the school curriculum, which was echoed by the father of one Peer Supporter:

I was quite happy, I'm quite happy for different life-style kind of teachings as well rather than the normal day-to-day proceedings of school. So it wasn't a concern and it's something that's probably important.

Father of Peer Supporter, A1, School 4, Intervention.

This view was reiterated by Peer Supporters, who were equally enthusiastic about having external trainers deliver PROGRAM-A. Youth workers were viewed as more friendly than teachers, with Peer Supporters noting their interactions with youth workers were less formal in comparison. This dynamic contributed to the creation of a relaxed environment which facilitated Peer Supporter engagement in activities. Peer Supporters also noted that as their interaction with PROGRAM-A trainers was limited to the workshop and follow-up sessions, they felt unencumbered by the risk of judgement.

I think it also helps with like the people who display [deliver] it. You might be a little more honest with a person you've never met before, or maybe a little less honest, it just depends on the person. But you might not be straight out honest with a teacher because you're going to see them the next day.

Alasdair, Peer Supporter (FG1), School 3, Intervention.

Peer education model

Teachers valued the inclusion of peer learning in PROGRAM-A, which provided opportunities for students to take ownership and responsibility for their own learning, as well as allowing students to acquire associated social and leadership skills. This point was particularly pertinent for teachers when reflecting on day 2 of the PROGRAM-A training workshop, where they expressed enthusiasm for the social skills Peer Supporters gained, as well as the confidence they gained through initiating conversations about their learning with their social networks (friends and family).

I'd say like the peer-to-peer, that is like a much more common thread in education now anyway, that they take responsibility for what's going on. So it's like lots of skills around... like the skills that they're learning, aside from the gambling stuff.

Teacher 3b, school 3, intervention

Peer Supporters' family members were equally enthusiastic about the social skills and confidence-building their child had acquired through the training workshop and engaging in message diffusion with their friends and family:

that's a really important part [social skills], that's the valuable bit for the children as much as the gambling, I would have thought, is the fact that... you know, building up their confidence— "social skills," that was the phrase I was looking for earlier. That's exactly what I meant when I said about putting her forward for it, it's that element of being good for them in an overall setting of how to grow up and how to mature and, yeah, I suppose, pass the message they've learnt back to people. So yeah, I mean, that kind of experience, I'd be surprised if nearly all parents didn't sort of say that would be a good thing that they'd want their children to be included in.

Peer Supporter Father, A2, School 4, Intervention.

Stakeholders did raise potential concerns around the safeguarding of Peer Supporters, specifically when engaging in potentially sensitive conversations about gambling and GRH with their social networks. Nonetheless, there was acknowledgment that Peer Supporters were instructed to have conversations based on facts they had learned from the training workshop as opposed to identifying harms within their network and counselling others.

Coordination and delivery

Teachers and trainer coordination

While PROGRAM-A trainers coordinated the Peer Supporter two day training workshop, which included venue hire and transportation of students from school to the venue; a teaching lead within each school was required to assist with the planning and organisation of assembly halls and class rooms for the various components of PROGRAM-A. Specifically, lead teachers ensured parents and students were informed about the PROGRAM-A Trial; managed the coordination of parental and student consent; coordinated the baseline and follow-up pupil surveys across the entire S3 year group; organised classrooms for three follow-up sessions with Peer Supporters; and ensured that other teaching staff were aware of PROGRAM-A activities (e.g. allowing students to be let out of class to attend PROGRAM-A activities). While school staff anticipated the administrative tasks associated with the implementation of PROGRAM-A, it was acknowledged that coordination (both implementation and engagement in the process evaluation) presented challenges, particularly when coordinating with colleagues

across departments, and managing competing extracurricular activities that students were involved in (e.g. for example, classes taking part in geography field trips).

Looking at the timing of [PRoGRAM-A] and perhaps how it's spaced out [across the term]... I think a lot of schools would probably similar to that. But at the time of year [when PRoGRAM-A was delivered] it was probably OK, I think it was just the spacing of that and a lot going on with inputs quite regularly... we were trying to co-ordinate times within the school and what was available for yourselves [research team] and if it was the same class they could get affected and trying to pull people out, that's always been a bit of a difficult one and perhaps a slight barrier in that sense.

T5, School 5, Intervention.

However, despite the demand upon their time, teachers across both control and intervention schools were largely positive about their involvement in PRoGRAM-A.

Peer supporter nomination process

For some teachers, the nomination process identified students that they would not initially have thought of as being particularly influential across their year group. Nonetheless, as noted in the comment below, teachers recognised that students' social networks were expansive due to their ability to interact both in-person and virtually through social media.

But what's interesting, I feel, in schools when I look back to when I was in school, even where you have different groups and friendships, there's so much more overlap in terms of students really communicating and talking to each other, both in school on the ground but also through social media. So those social networks, although they've got close networks, they're expansive of them all continually interacting with one another in different classes and just in social areas, and online at home and outside.

Teacher 5, School 5, intervention

Students (Peer and Non-Peer Supporters) had more mixed views on whether Peer Supporters were perceived to represent the range of social groups across their year group. While some felt proud to have been nominated and regarded as influential across their year group, others assumed they had been nominated as a joke, as noted below:

Interviewer: Right, you didn't think that people looked up to you?

Ella: No, I thought it was like a joke, my friends would probably put me down like as a joke but I don't know.

Noel: Yeah, and I didn't think many people voted like seriously with who they respect.

Ella: Yeah, because there are a few people on there we were like "well...!"

Interviewer: Is that true for all of you, you kind of nominated your friendship group rather than someone you don't know?

Eva: Well, yeah, I think some of the... like the sports leaders one, they were quite accurate. But then some were like "who you think is the most responsible," it was a bit like just for a joke.

FG2, Peer Supporters, School 4, Intervention

Content of the workshops and follow-ups

The two-day training workshops were viewed positively by Peer Supporters and school staff. Factors contributing to this view included the interesting nature of the topic and the divergence from school learning experiences through their delivery by youth workers and the inclusion of fun activities. With respect to activities, Peer Supporters valued their interactive nature:

Yeah, it was good, it was fun, because there was like lots of activities, like group activities, so like you didn't really get bored.

Logan, Peer Supporter (FG4), School 5, Intervention.

Peer Supporters commented that content covered in the workshops was engaging, with one participant describing the content as "interesting" and another stating that it was "all good" (FG1). However, suggestions for improving the content were made. For example, some questioned the balance of content concerning licensed forms of gambling vs. gambling-adjacent video-game practices. As gambling-adjacent videogame practices were deemed more accessible than traditional licensed gambling, some, mostly male, Peer Supporters believed more time should be dedicated to this subject.

Logan: Computer games, our age, yeah, I think that's probably the main and only thing, I think, for our age.

Interviewer: So do you think we could like tailor it better so that it was more relevant, so maybe focusing more on that stuff?

Caleb: Yeah.

Harvey: I think it was tailored quite well but we didn't talk about that as much as we did like betting on like football games and stuff, like using betting apps.

Peer Supporters (FG4), School 5, Intervention.

While female Peer Supporters agreed with this view, they also acknowledged that the subject of gambling-adjacent activities via gaming was less relevant to them as they were less likely to game in their spare time. Despite some aspects of the workshop content feeling less relevant for girls, all Peer Supporters expressed that they enjoyed the interactive and engaging activities within the training workshop, which took place in a venue outside of school grounds. The follow-up sessions, however ran within school classrooms and were time limited to just one class period. Feedback from students suggested that follow-up sessions were less engaging than the workshop.

Interviewer: Is there anything else you think that we could have done at the follow-up sessions that would have made it more useful?

Faith: Maybe be like more interactive like it was on the two-day trip.

Interviewer: What did you feel wasn't so good about the follow-up sessions?

Faith: I don't know, it was just like talking about it. But I think it was because there was like loads of follow-up sessions where we're just talking, it got like a bit boring.

Peer Supporters (FG3), School 5, Intervention.

Peer supporter conversations

While all Peer Supporters reported successfully having conversations with friends and family, some found the topic of gambling to be somewhat of a barrier when talking to friends as opposed to adults. This was reported to be because friends were less interested or responsive to discussions, as illustrated below:

Ben: It was harder to have a conversation with your friends about it.

Interviewer: What made it harder?

Ben: They just weren't engaged as much.

Peer Supporters (FG4), School 5, Intervention.

Conversations with adults on the other hand, were reported to have been somewhat easier to initiate and sustain. One way of increasing the salience of the topic of gambling for young people was the suggestion from students to incorporate examples of lived experience within the PROGRAM-A workshop content (currently we have fictional short vignettes). Family members of Peer Supporters similarly noted that real world examples of gamblers' experiences would increase young people's appreciation of the potential harms that may arise from

gambling and help place these harms within the context of everyday life.

I was saying earlier about... passing the message on, I'm sure it will filter through. It's just whether there might be another way you could supplement that... if you had someone at one of those [training workshop] or some way of presenting it in a different way than a teacher. I mean, obviously you guys are in there so I think that's different from a teacher. But a way of sort of telling a story from somebody with a story to tell. I mean, I don't know if it would be right for you to take in an ex-gambling addict or something— I don't know if that's kind of the done thing in what you're doing there— but I mean, something along those lines I think would land quite well and probably prick people's attention a little bit more.

Peer Supporter Father, A2, School 4, Intervention.

Despite challenges reported by some Peer Supporters to initiate and sustain conversations with friends, many reported discussing some of the learning they had acquired, suggesting that PROGRAM-A was both acceptable and feasible to deliver using peer to peer approaches. It was noted that conversations were easier to initiate immediately after the workshop and follow-up sessions as fellow students were curious to know what Peer Supporters had been doing. Among the students we spoke to (Non-Peer and Peer Supporters), the idea of having their peers relay gambling and GRH messaging was generally well supported:

I think it's better than the teacher because it's someone your age that you're up close to, I think you like believe it more and actually listen to them.

Bonnie, Non-Peer Supporter (FG1), School 3, Intervention.

Future intentions

The final theme assessing the acceptability and feasibility of PROGRAM-A emerged from teachers' and trainers' willingness to take part in future cycles of the intervention. As has been highlighted throughout, teachers from both control and intervention schools were overwhelmingly positive about their involvement in the PROGRAM-A Trial. When asked if they would take part in another cycle of the intervention, if offered, all reported that they would. Reflecting upon teacher's perceptions of the acceptability of the topic of gambling and GRH being covered within the school curriculum, all spoke of their intention to continue to work towards embedding the topic.

Yes. We're going through a PSHE [personal, social and health education] curriculum review just now, that's kind of one of our big focuses going into the next session, and topics like that will certainly come into it within our substance lessons. And that is one I looked at last year for third year so I'll be looking at that and just seeing is there ways that we'd want to embed that either further down or how would that fit into other areas. And thinking about senior schools, what's relevant there? But a lot of that's going to always come down to our pupil voice, that's our other kind of focus, just to get that feedback then from students in terms of what's relevant to them, what do they really see affecting them, what do they want to be looking at?

Teacher 5, School 5, Intervention.

Discussion

PRoGRAM-A was feasible and acceptable to students, staff and parents and delivered with a high degree of fidelity to the implementation manual. It was appealing to schools as it allowed teachers to address the topic of gambling, which had already been flagged as an issue for some of the schools, but they lacked the skill and capacity to take action. A core strength of PRoGRAM-A was its rigorous development and evaluation, free from gambling industry interference. In turn, teachers were keen to engage with PRoGRAM- as it was perceived to offer students with up-to-date evidence on a growing area of public health concern. The value of externally developed interventions, which are seen to provide up-to-date evidence and materials for students has been reported elsewhere by teachers involved in a previous study that adopted the ASSIST intervention delivery model [16]. Students enjoyed the interactive nature of the two-day training workshop, commenting on the fun activities that made the topic more memorable than standard class-based learning delivered by teachers. It was further reported by students, teachers, and students' parents and carers that external trainers were best placed to deliver the two-day PRoGRAM-A training workshop. Factors associated with this preference was a recognition that students felt more at ease discussing the topic of gambling with trained youth workers as opposed to their class teachers. It was also noted that external trainers had the ability to bring the topic of gambling and GRH "to life". Similar findings relating to the ability of external trainers possessing the ability to deliver dynamic and interesting sessions for students on a range of health behaviour issues have been reported elsewhere [16–19]. Lack of capacity reported by school staff to develop and deliver an intervention on the topic of gambling was also a prominent factor in staffs' preference for external trainers

to deliver PRoGRAM-A. Minimising staff overwhelm by providing an evidenced-based and externally delivered preventative health intervention on the topic of GRH was therefore welcomed and hugely valued by school staff. Students (both Peer and Non-Peer Supporters) further reported that it was acceptable for their peers to deliver public health messaging around gambling and GRH. This was similarly reflected upon by teachers and parents and carers, who noted that peer-based models allowed student to "take ownership" and "responsibility" of their own learning. The social skills acquired by Peer Supporters being perceived to build students' confidence, a finding that have also been reported on elsewhere [16–19].

Some of the challenges and areas for future refinement centred on student engagement with PRoGRAM-A content. For example, future iterations of the training materials should embed real-world/lived experience examples of gambling and gambling related harms. Lole, Hing [20] report the benefits of incorporating lived experience into educational programmes with young people on the topic of gambling and GRH. In doing so, lived experience is reported to increase students' engagement in messaging around gambling and GRH due to increase feelings of trustworthiness and authenticity. Future iterations of the training materials should also ensure that the intersection of gambling and gaming is made more salient for girls. Research suggests that while males are more likely to engage in online gaming and gambling adjacent activities (specifically paying to open loot boxes/mystery boxes or other gambling-adjacent online activities) the gender gap is narrowing [21]. This is particularly important if PRoGRAM-A is to avoid situating gambling and gaming as a topic that is only relevant for boys. Future iterations of PRoGRAM-A should incorporate content on gambling adjacent-gaming that is relevant and engaging for both boys and girls to avoiding creating polarisation between genders. To do this, further engagement with young person panels/patient, public involvement (PPI) groups should be undertaken to better identify video-games, gaming apps and platforms that are most commonly played among boys and girls.

While Peer Supporters felt confident having conversations with friends and family at the end of the two-day training workshop, it was clear from focus group discussions that Peer Supporters found it challenging to engage their friends in conversations about gambling. Echoing findings from similar studies reported elsewhere [16, 17]. Conversely, it was reported to be easier to initiate conversations with adults (such as family members). The challenges Peer Supporters encountered when attempting to hold conversations with friends their own age may be related to the fact that young people typically reported not ever having conversations with friends about the topic of gambling. Discussing a novel topic, that is or

is not initially perceived to be relevant for young people, may have presented challenges for Peer Supporter to have sustained or in-depth conversations with their friends. Typically, Peer Supporters reported having more conversations immediately after attending the two-day workshop and follow-up sessions. This was perhaps due to feeling confident about initiating conversations immediately after attending sessions, but also due to others initiating conversations with Peer Supporters out of curiosity (e.g., wanting to know what Peer Supporters had been learning at the workshop/follow-up sessions) [22].

Two further intervention refinements could therefore be adopted to better support Peer Supporters in initiation and sustaining conversation. Firstly, the intervention could refine the social skills practical sessions to better support Peer Supporters to manage challenging conversations by helping them to identify relevant means of initiating conversations with young people their age. Specifically, the social skills activity could focus on supporting Peer Supporters to identify ways of discussing the topic of gambling and GRH in ways that are most relevant for young people. Similar recommendations to encourage have been reported elsewhere [16]. Secondly, stand-alone lesson(s) on gambling and GRH could be delivered to the entire year group/information pamphlets could be sent home to parents/carers, to enable alters to both initiate and engage in conversations about what the Peer Supporter Peer Supporters had learned about through their involvement in PROGRAM-A. These are achievable refinements within the current intervention theory and design.

Peer Supporters enjoyed the interactive and engaging activities within the training workshop, which took place in a venue outside of school grounds. The follow-up sessions, however ran within school classrooms and were time limited to just one class period. Feedback from students suggested that follow-up sessions were less engaging than the workshop. Similar findings on the delivery of follow-up sessions being less engaging than the initial two-day workshop have been reported elsewhere [17]. Further refinements to the delivery of follow-up sessions could consider ways of making the sessions more engaging by reducing the number of follow-up sessions to condense the sessions into one or two longer sessions that would allow more time to engage in interactive group work to ensure that students achieved the most out of the follow-up sessions.

Lastly, despite teachers being overwhelmingly positive about the planning and organisation of PROGRAM-A, challenges were experienced in terms of coordinating students and liaising with other teaching staff. If progressing to a full-scale trial, it would be beneficial to recommend the role of link teacher be shared between two members of staff, particularly within larger schools.

Strengths and limitations of the study

This study has many strengths. It is the first to demonstrate the feasibility and acceptability of a non-industry funded preventative educational intervention to address gambling and GRH among young people within the UK. Our process evaluation included wide engagement from high level stakeholders across national government, public health and education directorates. A further strength of PROGRAM-A was its use of peer-based learning to support message diffusion. As has been shown in previous studies, peer-based approaches have the capacity to shift the way we discuss complex health relevant issues [16, 19, 23–30], and in the case of PROGRAM-A, specifically equipping students with the skills to critique societal norms around gambling, and query understandings and knowledge of what constitutes gambling. In doing so, making the topic both contemporary and relevant for young people. However, it also has limitations. In selecting and identifying Peer Supporters and Non-Peer Supporters to participate in focus group discussions, we were reliant upon teaching staff to share study information with students and identify willing participants. While successfully recruiting students to participate in focus group discussions, we do acknowledge the potential for participant bias among those agreeing to take part. These potential biases could include students likely to participate being those most confident or those with particularly positive or negative experiences to share. Nonetheless, we are confident that teachers' support in the recruitment of our focus group discussions allowed us to capture a range of students, and their views and experiences of participating in PROGRAM-A.

We experienced limited engagement with Peer Supporter's friends and family. While we made multiple attempts to engage friends and family members, we were reliant upon Peer Supporters sharing study information and invitations to participate in interviews. The ability to contact friends and family directly would have resulted in a larger sample being recruited.

A further limitation recognises that participants are likely to alter and/or modify their behaviour and responses when engaging in research, which has the potential to influence study outcomes [31]. To minimise the impact of our process evaluation upon the trial outcomes, interviews and focus group discussions with participants took place after the delivery phase of PROGRAM-A. However, observations of the delivery of PROGRAM-A cycle were undertaken in two intervention schools, which may have influenced the delivery and, in turn, our observation findings.

Conclusion

This study demonstrated that it is feasible and acceptable to deliver the PRoGRAM-A gambling harm reduction intervention within secondary schools with a high degree of fidelity [32]. Addressing the topic of gambling and GRH within the school curriculum was deemed to be acceptable by all sample groups, including students. The PRoGRAM-A mode of delivery (via a peer-to-peer model of learning alongside external trainers) was reported to be an appropriate way of actively engaging students. Furthermore, engaging in PRoGRAM-A had wider benefits for participants: teachers and students reflected on peer supporters' skills and confidence in engaging in message diffusion; teachers reflected on PRoGRAM-A as allowing them to address a gap within their curriculum, with minimal resources required from their school; and stakeholders noted the importance of a non-gambling industry funded school based intervention to counter industry advertising and messaging among young people, in turn making steps towards creating an environment of denormalisation of gambling within society [32, 33]. As this funded trial of PRoGRAM-A was delivered solely within Scotland, future research would include exploring the utility of applying PRoGRAM-A across the rest of the UK, and indeed, in other countries experiencing emerging trends in prevalence of gambling among young people.

Abbreviations

GRH Gambling-related harms

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12889-025-23565-8>.

Supplementary Material 1
Supplementary Material 2
Supplementary Material 3
Supplementary Material 4
Supplementary Material 5

Acknowledgements

We are very grateful to the Trial Steering Committee, school staff, students, the young people's Patient and Public Involvement (PPI) group and staff at Larkhall Universal Connections, and other stakeholders who have contributed to the development and evaluation of PRoGRAM-A. We would also like to thank Evidence to Impact for delivering the intervention, FastForward for sharing their experience of delivering a gambling prevention programme in a youth setting and Adetiq Ltd for data processing.

Author contributions

FD, MM, CW, HW, AS, DG, JW conceived of the trial and led the trial design, overall analysis plan and funding application. MM drafted the manuscript, with support from FH. MM, AN, LN and FD conducted fieldwork. MM, FH and LN undertook analysis of qualitative data. All authors contributed to the development of the study design and contributed to writing the manuscript.

FD, MM, AN, LN, FH, CW, HW, AS, DG, JW, RP and HE read and approved the final manuscript.

Funding

This study is funded by the NIHR Public Health Research programme (NIHR150838). The views expressed are those of the author(s) and not necessarily those of the NIHR or the Department of Health and Social Care. Funding was provided for intervention delivery by the Gambling Commission's Regulatory Settlement Fund.

Data availability

The datasets used and/or analysed during the current study are available from Dr Fiona Dobbie (Fiona.dobbie@ed.ac.uk) on reasonable request.

Declarations

Ethics approval and consent to participate

This study was approved by the Edinburgh Medical School Research Ethics Committee, University of Edinburgh (ref: 23-EMREC-016) on 9th August 2023. Approval was also sought from each school's Local Authority education department. Final approval was obtained from the head teacher at each school. All study participants provided informed consent. Parents or guardians of all participating minors were informed about the study via an information leaflet distributed by the school. If they wished to withdraw their child/children from the research they completed an opt-out form. Informed consent was therefore considered given unless an opt-out form was received. Students gave written student assent prior to fieldwork. Data collected throughout the study is in adherence with the Declaration of Helsinki.

Consent for publication

Not applicable.

Competing interests

In the last five years FD discloses grant funding for gambling-related projects from the Medical Research Council and the National Institute for Health and Social Research. FD has received payment to participate in an online focus group to help develop an awareness raising intervention to increase knowledge of the marketing strategies used by the gambling industry to promote their products. In the past 5 years, HW discloses grant funding for gambling-related projects from the National Institute for Health and Social Research, Economic and Social Research Council, Wellcome Trust, Office of Health Improvements and Disparities/Public Health Scotland, Gambling Commission (including regulatory settlement funds); Gambling Research Exchange Ontario, Greater London Authority, Greater Manchester Combined Authority and the Department for Culture Media and Sport. Between 2015 and 2020, she was Deputy Chair of the Advisory Board for Safer Gambling, providing independent advice to government on gambling policy with remuneration from the Gambling Commission. She has been paid consultancy fees by the Institute of Public Health, Ireland and the National Institute for Economic and Social Research. She is a member of the WHO Panel on gambling. She was paid as an expert witness on gambling by Lambeth and Middlesbrough Borough Councils. She received payment for delivery of a webinar by McGill University and travel costs to deliver a Keynote Address to the Gambling Regulators European Forum. She has received travel cost from the Turkish Green Crescent Society and Alberta Gambling Research Institute. She has provided unpaid research advice to GamCare. She runs a research consultancy practice for public and third sector bodies—she has never provided consultancy services to the gambling industry. All remaining authors declare that they have no competing interests.

Author details

¹Usher Institute, University of Edinburgh, Edinburgh, UK

²Centre for Trials Research, School of Medicine, Cardiff University, Cardiff, UK

³Faculty of Social Sciences, University of Stirling, Stirling, UK

⁴School of Earth and Environment, University of Leeds, Leeds, UK

⁵Edinburgh Clinical Trials Unit, University of Edinburgh, Edinburgh, UK

⁶School of Social and Political Sciences, University of Glasgow, Glasgow, UK

⁷Institute for Social Marketing, University of Stirling, Stirling, UK

Received: 14 March 2025 / Accepted: 11 June 2025

Published online: 03 July 2025

References

- Gambling Commission. Industry Statistics - November 2024 - Official statistics. 2024.
- Dobbie F, Miller M, Wardle H, Dahlby L, Weir C, Niven A, et al. Protocol for a pilot cluster randomised controlled trial of PROGRAM-A (preventing gambling-related harm in adolescents): a secondary school-based social network intervention. *Pilot Feasibility Stud.* 2024;10(1).
- Langham E, Thorne H, Browne M, Donaldson P, Rose J, Rockloff M. Understanding gambling related harm: a proposed definition, conceptual framework, and taxonomy of harms. *BMC Public Health.* 2016;16(80).
- Ipsos Mori. Young people and gambling 2024: official statistics. Gambling Commission; 2024.
- Ukhova M, Nikkinen J, Wardle H. Public health approaches to gambling: a global review of legislative trends. *Lancet Public Health.* 2024;9(1).
- Wardle H, Reith G, Langham E, Roberts. R gambling and public health: we need policy action to prevent harm. *BMJ.* 2019;365.
- Zendle D, Meyer R, Ballou N. The changing face of desktop video game monetisation: an exploration of exposure to loot boxes, pay to win, and cosmetic microtransactions in the most-played steam games of 2010–2019. *PLoS ONE.* 2020;15(5).
- Thomas S, van Schalkwyk, May CI, Daube. Mike, pitt, hannah, mcgee, darragh, mckee, martin. Protecting children and young people from contemporary marketing for gambling. *Health Promot Int.* 2023;38(2).
- Monreal-Bartolomé A, Barceló-Soler A, Bartolomé-Moreno G-CJ, Cruz, Cortés-Montávez, Paula, Acon, Esther, Huertes, María, Lacasa, Víctor, Crespo, Sofía, Lloret-Irles, Daniel, Sordo, Luis, Bote C. Catrina, Puigcorbó, Susanna, López-Del-Hoyo, Yolanda Preventive Gambling Programs for Adolescents and Young Adults: A Systematic Review. *Int J Environ Res Public Health.* 2023;7(20).
- van Schalkwyk MCI, Hawkins B, Petticrew M. The politics and fantasy of the gambling education discourse: an analysis of gambling industry-funded youth education programmes in the united Kingdom. *SSM - Popul Health.* 2022;18.
- Moore GFAS, Barker M, Bond L, Bonell C, Hardeman W, Moore L, O'Cathain A, Tinati T, Wight D. Process evaluation of complex interventions: Medical Research Council guidance. *BMJ: British Medical Journal.* 2015;350.
- Rogers EM. Diffusion of innovations. Riverside, New York: Riverside: Free; 2003.
- Valente TW. Network interventions. *Sci (American Association Advancement Science).* 2012;337:49–53.
- Hoffmann TCGP, Boutron I, Milne R, Perera R, Moher D, Barbour V, Johnston M, Lamb SE, Dixon-Woods M, Wyatt JC. Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *BMJ.* 2014;348.
- Thomas DR. General inductive approach for analyzing qualitative evaluation data. *Am J Evaluation.* 2006;27(2):237–46.
- Niven A, Miller M, White J, Noble L, Wardle H, Stoddart A, Griffiths D, Weir C, Ensor H, Maxwell C, Howell F, Purves R, Dobbie F. PROGRAM-A (Preventing gambling related harm in Adolescents): a pilot cluster randomised control trial to prevent gambling-related harm in young people: NIHR Synopsis Report. NIHR Journals Library [Under Review]; 2025.
- Mitchell KR, Purcell C, Simpson SA, Broccatelli C, Bailey JV, Barry SJE, Elliott L, Forsyth R, Hunter R, McCann M, McDaid L, Wetherall K, Moore. L feasibility study of peer-led and school-based social network intervention (STASH) to promote adolescent sexual health. *Pilot Feasibility Stud.* 2021;7:125.
- Dobbie F, Purves R, McKell J, Dougall N, White J, Campbell R, et al. A process evaluation of the implementation of ASSIST in scotland: final report. Stirling: University of Stirling; 2017.
- White J, Hawkins J, Madden K, Grant A, Er V, Angela L, Pickles T, Kelson M, Fletcher A, Murphy S, Midgley L, Eccles G, Cox G, Hollingworth W, Campbell R, Hickman M, Bonell C, Moore L. Adapting the ASSIST model of informal peer-led intervention delivery to the Talk to FRANK drug prevention programme in UK secondary schools (ASSIST + FRANK): intervention development, refinement and a pilot cluster randomised controlled trial. *Public Health Research, NIHR Journals Library.* 2017;5(7).
- Sebire SJ, Banfield, Kathryn, Jago R, Edwards MJ, Campbell, Rona, Kipping R, Blair PS, Kadir, Bryar, Garfield, Kirsty, Matthews, Joe, Lyons, Ronan A., Hollingworth. William A process evaluation of the PLAN-A intervention (Peer-Led physical Activity iNtervention for Adolescent girls). *BMC Public Health.* 2019;19(1209).
- Lole L, Hing N, Thorne H, Sproston K, Hodge N, Rockloff M. Let's be honest: adolescents speak up on how to better protect young people from gambling harm. *J Appl Youth Stud.* 2024.
- Fanning M, Collard S, Davies S. Power, intersectionality and stigma: informing a gender- and spatially-sensitive public health approach to women and gambling in great Britain. Volume 26. *Health & Place;* 2024.
- Griffiths D, Miller M, Nobe L, White J, Niven A, Wardle H, Weir C, Ensor H, Stoddart A, Howell F, Purves R, Dobbie F. Mapping the diffusion of PROGRAM-A: a school-based, peer-led prevention of gambling-related harm intervention. *Social Forces [Under review];* 2025.
- Edwards KM, Banyard VL, Waterman EA, Hopfauf SL, Shin HS, Simon B, Valente TW. Use of social network analysis to identify popular opinion leaders for a youth-led sexual violence prevention initiative. *Violence against Women.* 2022;28(2):664–85.
- Chu KH, Sidani J, Matheny S, Rothenberger SD, Miller E, Valente T, Robertson L. Implementation of a cluster randomized controlled trial: identifying student peer leaders to lead E-cigarette interventions. *Addict Behaviours.* 2021;114(106726).
- Hirvonen M, Purcell C, Elliott L, Bailey JV, Simpson SA, McDaid L, Moore L, Mitchell KR, and STASH Study Team. Peer-to-peer sharing of social media messages on sexual health in a school-based intervention: opportunities/challenges identified in the STASH feasibility trial. *J Med Internet Res.* 2021;23(2).
- Forsyth R, Purcell C, Barry S, Simpson S, Hunter R, McDaid L, Elliot L, Bailey J, Wetherall K, McCann M, Broccatelli C. Peer-led intervention to prevent and reduce STI transmission and improve sexual health in secondary schools (STASH): protocol for a feasibility study. *Pilot Feasibility Stud.* 2018;4:1–14.
- Pickering TA, Wyman PA, Schmeelk-Cone K, Hartley C, Valente TW, Pisani AR, Rulison KL, Brown CH, LoMurray M. Diffusion of a peer-led suicide preventive intervention through school-based student peer and adult networks. *Front Psychiatry.* 2018;9.
- Bell SL, Audrey S, Cooper AR, Noble S, Campbell R. Lessons from a peer-led obesity prevention programme in english schools. *Health Promot Int.* 2017;32(2):250–9.
- Stephenson JM, Strange V, Forrest S, Oakley A, Copas A, Allen E, Babiker A, Black S, Ali M, Monteiro H, Johnson AM. Pupil-led sex education in England (RIPPLE study): cluster-randomised intervention trial. *Lancet.* 2004;364:338–46.
- Dobbie F, Purves R, McKell J, Dougall N, Campbell R, White J et al. Implementation of a peer-led school based smoking prevention programme: a mixed methods process evaluation. *BMC Public Health.* 2019;19(742).
- Audrey S, Holliday J, Parry-Langdon N, Campbell R. Meeting the challenges of implementing process evaluation within randomized controlled trials: the example of ASSIST (A stop smoking in schools Trial). *Health Educ Res.* 2006;21(3):366–77.
- Dobbie F, Miller M, Niven A, Wardle H, Weir C, Ensor H, et al. preventing gambling related harm in adolescents (PROGRAM A) a secondary school based social network intervention: results from a pilot cluster randomized controlled trial. *Addict [Under Review].* 2025.

Publisher's note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.