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Synopsis

Preventing Gambling Related Harm in Adolescents: PRoGRAM – A pilot cluster RCT – Synopsis Report

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Published March 2026
DOI: 10.3310/GJFD3715
Volume 14 • Issue 4

Abstract

Background: Young people's engagement in gambling can be linked to gambling-related harm. There is a lack of independently funded and evidence-based school-based interventions that seek to prevent and reduce the harms associated with gambling.

Objectives: To conduct a pilot cluster randomised controlled trial of a gambling prevention intervention (Preventing Gambling Related Harm in Adolescents) among young people aged 13–15 years to determine the utility of conducting a phase III randomised controlled trial assessing effectiveness and cost-effectiveness.

Design and methods: Two-arm, pilot cluster randomised controlled trial with an embedded process evaluation, health economic scoping study and social network analysis.

Setting: Six state schools across Scotland: four intervention and two control.

Participants: Students aged 13–15 years (baseline: intervention $N = 762$ students, control $N = 352$ students. Follow-up: intervention $N = 598$ students, control $N = 295$ students).

Intervention: Preventing Gambling Related Harm in Adolescents is a peer-led, social network intervention to prevent adolescent gambling and reduce gambling-related harm. Students, nominated by peers in their year group, attended a 2-day training workshop outside of school, which was delivered by trained youth workers. After completing the 2-day training workshop, students were then assigned the role of 'peer supporters'. Peer supporters then attended three in-school follow-up sessions, with the same youth workers, to refresh the learning they had received during the workshop. After the workshop and during the follow-up sessions, peer supporters were encouraged to have conversations about their learning on the topic of gambling and gambling-related harm with their friends and family. Social network maps were created by peer supporters to: (1) help them identify people to speak to and (2) record to who they spoke to about gambling and gambling-related harm.

Main outcome measures: Progression to a full-scale Phase III cluster randomised control trial, using pre-set progression criteria. Progression criteria were: (1) successful recruitment of six schools; (2) five schools remain in the pilot study; (3) the intervention being delivered with 80% fidelity to the manual; (4) the process evaluation indicates the intervention is acceptable to students and staff and (5) 70% of students complete the student questionnaire at baseline and follow-up.

This synopsis should be referenced as follows:
Niven A, Miller M, White J, Noble L, Wardle H, Stoddart A, *et al.* Preventing Gambling Related Harm in Adolescents: PRoGRAM – A pilot cluster RCT – Synopsis Report. *Public Health Res* 2026;**14**(4). https://doi.org/10.3310/GJFD3715

Results: All five progression criteria were met. All schools were recruited and retained in the study and there were low levels of missing data on outcomes. The process evaluation indicated that Preventing Gambling Related Harm in Adolescents was acceptable to all stakeholders and was delivered with fidelity to the delivery manual. Some minor refinements to the intervention and trial methods would aid student perception of the real-world effects of gambling. Indicative costs to deliver two cycles of Preventing Gambling Related Harm in Adolescents in one school were £8313.00, with a mean cost per student of £28.08.
Limitations: A limitation is student self-reported gambling behaviour. This relied on their interpretation of what gambling is, which varied.
Conclusions: Delivery of the Preventing Gambling Related Harm in Adolescents intervention was both feasible and acceptable, indicating that the study could progress to a full-scale Phase III randomised controlled trial, with minor amendments to the intervention and trial processes.
Future work: Preventing Gambling Related Harm in Adolescents should progress to a full-scale randomised controlled trial.
Funding: This synopsis presents independent research funded by the National Institute for Health and Care Research (NIHR) Public Health Research programme as award number NIHR150838.
A plain language summary of this synopsis is available on the NIHR Journals Library Website https://doi.org/10.3310/GJFD3715.

Introduction

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Research rationale and background

In the last 20 years, the commercial gambling market has been transformed by technological advances, which have resulted in easier and more frequent opportunities to gamble. The development of sophisticated and targeted marketing strategies has resulted in greater public awareness and acceptability of gambling, with the predicated global gambling revenue to be around $700 billion (by 2028) (conversion of dollar to GBP: $1 = 0.73 £, date of conversion 16 September 2025).[2–5] There is now an extensive body of evidence illustrating the harmful effects of gambling and its potential to exacerbate inequalities.[6,7] Gambling is, therefore, increasingly recognised as a global public health issue, with preventing gambling-related harm (GRH) in children and young people a key priority.

The term GRH captures the adverse impact of gambling with respect to the health and well-being of an individual, their family, community or society.[8] The economic implications of harmful gambling are substantial with the direct and social cost in Great Britain, estimated to be between £1.05B and £1.77B pounds.[9] Studies of social costs are unable to attribute costs to the full range of harms associated with gambling and are, therefore, likely to be conservative estimates.[9,10] These harms are not restricted to an individual but extend to those around them, with an average of six others being affected for each person experiencing GRH.[11] Due to the potential impact of gambling upon health and well-being, children and young people are generally prohibited from most forms of commercial gambling until the age of 18 years.

Young people and gambling behaviour in the United Kingdom

The Young Persons Gambling Survey (YPGS) is the main data source on young people and gambling, reporting annually with data collection from Scotland, England and Wales. Findings from the 2024 survey reported that 27% of 11- to 17-year-olds had spent their own money on gambling activity in the last 12 months compared with 15% who reported vaping, 8% who reported smoking and 7% who reported using illegal drugs. Alcohol consumption remained the highest at 37%.[12] The survey also found that 1.5% of young people were classified as a 'problem gambler'; the proportion in 2023 was 0.7%. This means that problem gambling in young people, in Great Britain, has doubled in 1 year.[12] Several observational studies have documented associations indicating that childhood gambling participation has a negative impact on children's finances, emotional and academic development, relationships, and physical and mental health, which may extend into later life.[12–14]

The YPGS is likely to underestimate gambling and gambling-like behaviours among this age group as it only includes activities that meet the regulator (the Gambling Commission's) definition of gambling. Under this definition, gambling refers to gaming, betting and lottery

participation. Gaming, in this sense, does not refer to video games but games that involve 'chance' such as blackjack or online slot machines. Simulated gambling – defined as games that replicate or mimic gambling activities but do not involve monetary risk – and 'gambling-adjacent' video game add-ons, such as loot boxes, skin betting and social casino games are excluded from the definition.[15]

Exposure to gambling-adjacent activities has exponentially increased in the past 20 years, with analysis of the popular gaming platform *Steam* revealing the percentage of individuals who played video games featuring loot boxes increased from 4.2% to 71.2% between 2010 and 2019.[16] These activities are popular, with 27% of young people aged 11–17 years reporting that they had opened a loot box (extra, often paid for 'random' items that can improve performance of game or cosmetic appearance of game character) in the past 12 months in 2024.[12] This is more prevalent than participation in traditional forms of commercial gambling, such as arcade gaming machines (20%) over the same period.[12]

Drawing from this and supported by findings from our Medical Research Council funded development and feasibility study (MR/S019200/1), Preventing Gambling-related Harm in Adolescents (PRoGRAM-A), has taken a child-centred perspective to define gambling as betting or wagering things of value (including but not limited to fiat currency, digital currency and objects of value).[12,17,18]

Factors that influence young people's behaviour and attitudes towards gambling

The influence that family and peer norms have on young people's behaviour is widely accepted, with the association between familial and peer gambling and the increased likelihood of adolescent participation well supported.[19–23] This receptiveness is, in turn, promoted by the changing normative environment for gambling, for which advertising and sponsorship is a key driver. The introduction of the 2005 Gambling Act saw the liberalisation of gambling regulation, which has resulted in a surge of online gambling platforms and associated marketing. Between 2015 and 2018, the estimated spend on 'paid for' gambling advertising in the UK increased from £264M to £328M.[24] Despite not being old enough to gamble, 70% of young people in Scotland aged 11–17 years recalled having seen or heard gambling being advertised in 2024.[12,24–26] The rise of gambling-adjacent mechanics within video games further contributes to the normalisation of gambling among young people. Evidence suggests that young people who engage with gambling-adjacent content within video games are more at risk of traditionally defined problematic gambling behaviour.[27,28] Unlike other countries which do categorise these activities as gambling, the UK does not currently impose age-restrictions on playing video games with gambling-adjacent content.

Framing gambling

As with other risk-taking behaviours, a common discourse from the gambling industry and UK government is individual responsibility for gambling behaviour – one that problematises individuals' use of gambling products as opposed to the products themselves.[29] Consequently, understanding of GRH in terms of individual pathology has largely dominated.[30] As such, interventions to prevent GRH have centred on identifying and treating a small proportion of individuals falling under the medical category of 'problem gamblers'.[31] These interventions neglect the larger group of gamblers who do not meet diagnostic criteria but experience GRH. This perspective is now heavily criticised for failing to recognise the role of the gambling industry who actively target and promote gambling to the consumer. The gambling industry is increasingly being viewed as another commercial determinant of health similar to the tobacco or alcohol industry where profits are made at the expense of individual's health.[32]

School-based prevention activities

Behaviour change interventions targeting young people are commonly delivered in schools for a variety of reasons,[33,34] with one of the main reasons being reach (attendance is, in principle, compulsory until the age of 16 years). The effectiveness of school-based interventions to improve the health of young people, however, is variable.[35] Reasons for this are associated with variation in outcome measures, poor reporting and lack of longitudinal follow-up. However, mode of delivery can be effective, with peer-led methods achieving positive results.[36] This has been attributed to young people's greater acceptance of peer-led interventions and perception of increased credibility of their peers.[33,37–41]

One example is a smoking prevention programme called A Stop Smoking in Schools Trial (ASSIST). ASSIST is a school-based, peer-led, smoking prevention programme that has been shown to be effective in reducing regular smoking in adolescents.[42] Based on positive results from a cluster randomised controlled trial (cRCT), ASSIST has been rolled out across England, Wales, with adaptation and pilot implementation in Scotland, France, Northern Ireland and Columbia.[43] The theory underpinning ASSIST has also been adapted to address other risk-taking behaviours and health promotion activities. Examples include: healthy eating and physical activity – AHEAD,[44] physical activity in young women – PLAN A,[45] drug prevention – ASSIST + FRANK,

FRANK Friends,[38] sexual health (STASH)[46] and now, PRoGRAM-A.

Despite existing interventions targeting young people and other risk-taking behaviours (such as tobacco, alcohol and drugs), evidence-based (and independently funded) gambling prevention programmes are lacking. Those that do exist have, predominately, been developed by organisations with direct or indirect funding from the gambling industry. These programmes have been criticised for lacking appropriate development and programme theory, framing GRH as restricted to a small minority who 'misuse' gambling products and casting doubt on the dangers of gambling.[47]

There is, therefore, a need to develop youth prevention initiatives independent from gambling industry influence. PRoGRAM-A responds to this call by being one of the first evidence-based and independently funded gambling prevention interventions in the UK.

Overall aim

The overall aim of this study was to conduct a pilot cRCT of a gambling prevention intervention (PRoGRAM-A) among young people aged 13–15 years to determine the utility of conducting a Phase III randomised controlled trial (RCT) assessing effectiveness and cost-effectiveness.

Research questions

The aim was unpacked via a series of research questions, which are grouped under two blocks.

Recruitment and randomised trial delivery

1. Can a sufficient number of schools and students be recruited, randomly allocated and retained?
2. How can the collection of baseline and follow-up data be optimised?
3. What gambling prevention activities occur in control schools and how is the impact perceived?
4. Following the pilot cRCT, is a Phase III cRCT justified in relation to our progression criteria?

Acceptability, feasibility and fidelity of intervention delivery

5. Is it feasible and acceptable to implement the intervention in four schools?
6. What do qualitative and quantitative data suggest in terms of refinements to programme theory, implementation, fidelity, reach, scalability and acceptability?
7. Are there potential harms and unintended consequences of the intervention? How might these be reduced? How can these be measured?
8. What characteristics are associated with being nominated as a peer supporter?
9. What is the potential and actual extent of message diffusion in peer supporter networks and to whom and why?
10. What contextual factors influence message diffusion (e.g. size of student networks; where, when and how conversations are initiated; what communication methods are used; what is discussed; level of peer supporter confidence)?
11. What are the key issues to consider to support future scalability?
12. What are the direct implementation costs associated with delivering PRoGRAM-A?
13. What economic measures are appropriate and available for use in a future health economic evaluation as part of a definitive cRCT?

Methods for data collection and analysis

This section provides an overview of the methods for data collection and analysis. Full details of the study design are reported in our published protocol.[48]

Study design

The study design comprised of a two-arm, pilot cRCT with an embedded process evaluation, health economic scoping study and social network analysis. It was conducted in six state-funded secondary schools in Scotland (four PRoGRAM-A intervention, two control). Control schools delivered no formal prevention of GRH education. Students in S3 (third year in secondary school, aged 13–15 years) were invited to take part. *Table 1* presents a summary of the different components of the study design.

Health economic scoping study

The health economic scoping study had two key objectives. The first was to estimate PRoGRAM-A direct implementation costs. Delivery costs for PRoGRAM-A were provided to the study Health Economist by Evidence to Impact, who led intervention delivery.

The second objective was to identify outcome measures for a future health economic evaluation. This objective was specifically concerned with identifying a maximum price per school that future commissioners (e.g. Local Authorities) would consider worth paying. However, the criteria that would underpin this value were not immediately apparent in a context where the long-term harms of gambling fall on a number of sectors, and a wide range of stakeholders and potential funders may have different objectives. We, therefore, tried to identify these

TABLE 1 Summary of PRoGRAM-A study design

Research method	Sample group	Timescales	Key area covered
Self-complete questionnaire – baseline and a 6-month follow-up	Students in all six study schools, delivered in school via a special assembly where the whole year took part at the same time. This was done under exam conditions when possible	Month 6 and months 12–14	Testing potential outcome measures for future Phase III cRCT
Process evaluation			
Semistructured interviews	Trainers ([a]*n* = 5) Teaching staff (*n* = 6) Key stakeholders (*n* = 8, representatives from government, public health, education and third sector) Alters (peer supporter friends and family members, *n* = 2)	Months 12–14	Acceptability and feasibility of intervention; mechanisms of change Health economic outcomes of interest assessment
Mini focus group discussion/paired interviews	Peer supporters (*n* = 8 groups in total) two per intervention school (approximate sample size of 32–48) Students who were not nominated to become a peer supporter (intervention schools only, two groups in total, one per school approximate sample size of 8–16)	Months 12–14	Acceptability and feasibility of intervention; mechanisms of change
Observation	Using a semistructured observation log book, two entire delivery cycles of PRoGRAM-A were observed, in two separate schools	Months 4–12	Fidelity of delivery
Social network data	Whole school network constructed from baseline survey Peer Support network sociograms (approximate sample size of 32–48)	Months 4–6 and 14–16	Contamination, reach, mechanisms of change, feasibility of intervention; equality of diffusion

a *N* = number of interviews achieved

criteria in two ways. First, questions were integrated into the process evaluation's stakeholder topic guide to probe what cost-effectiveness evidence (benefits and cost outcomes) interviewees thought that they, or their organisation, would like to see to support a hypothetical future roll-out. Second, we conducted targeted (non-systematic) searches for literature on similar studies of cost-effectiveness and/or cost of illness of gambling prevention interventions.

Preventing Gambling Related Harm in Adolescents intervention

Appendix 2 shows the logic model for PRoGRAM-A. PRoGRAM-A is a peer-led, social network intervention to prevent adolescent gambling and, therefore, reduce gambling harm. It is summarised in an intervention flow chart (*Figure 1*) and fully described using the 'Template for Intervention Design and Replication' (TIDiER), which is appended (see *Appendix 1*).

Collection of social network data

As noted in *School-based prevention activities*, PRoGRAM-A is informed by an existing smoking prevention programme called ASSIST. ASSIST encouraged students to talk to other students in their year group. Two important extensions to the programme theory for PRoGRAM-A were: (1) the use of sociograms (i.e. maps of an individual's social network) to help peer supporters think about who they might engage a conversation with about the topic of gambling or a linked topic relating to gambling and GRH (including marketing) and (2) to suggest that conversations could occur with other people outside of students' year group.

On day 2 of training, peer supporters were given a blank piece of paper with two concentric circles and were asked to write their name in the smallest circle in the centre. Then, using the following name generation question – *Who do you regularly see or speak to?* (with regularly defined as at least once a month), they were asked to write the first name only for each person they thought of directly onto their map (also called a 'sociogram').[49] They were also asked to add their relationship to each person in brackets (e.g. Lorna and mum). Names could be added anywhere on the map and it did not matter how close they felt to the person. The aim was to help peer supporters think about the number of people they see and talk to on a regular basis and could (in theory) start a conversation with (*Figure 2*).

Once peer supporters had listed their friends and family members, they were given red sticky dots to put next to the people on their maps who they planned to have a conversation with. We then helped them think about how, where and when they could initiate a conversation. At each subsequent follow-up session with the trainers,

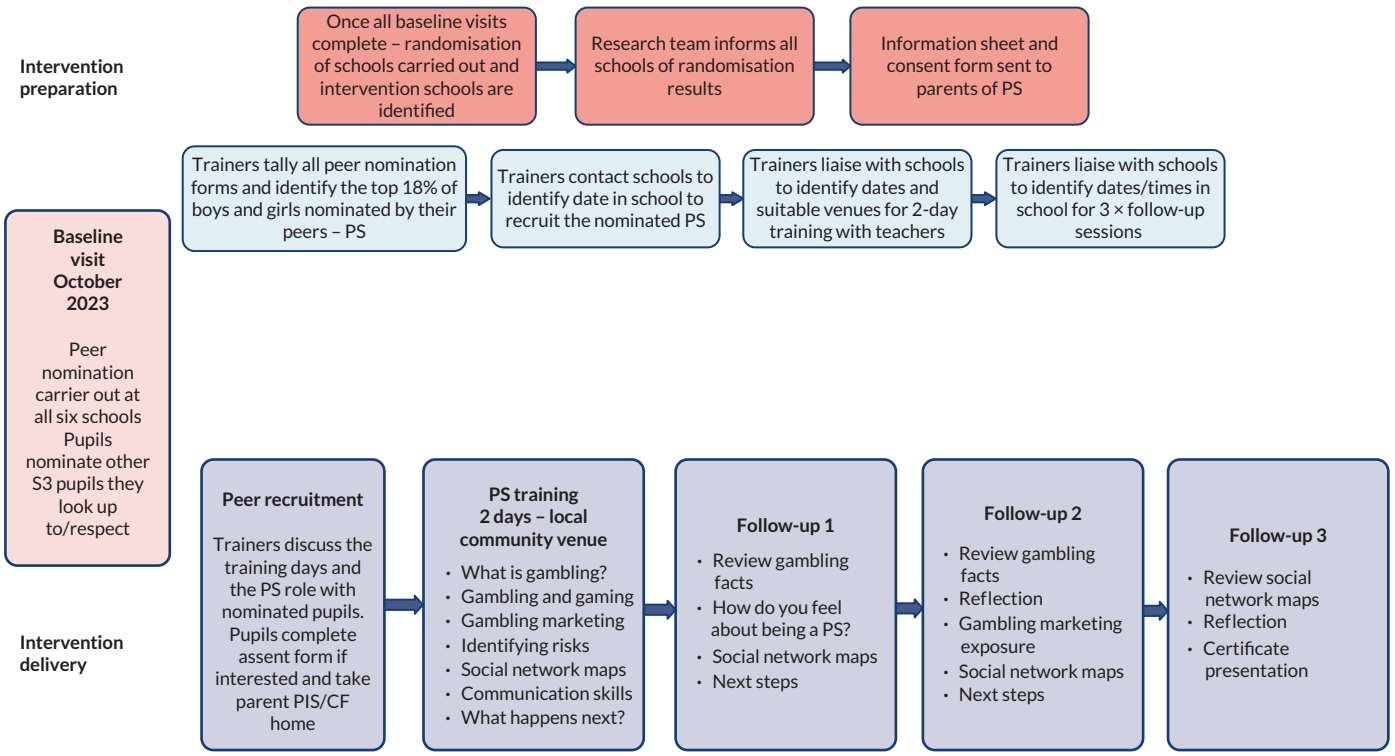

FIGURE 1 The PRoGRAM-A intervention flow chart. CF, Consent Form; PIS, patient information sheet; PS, peer supporters.

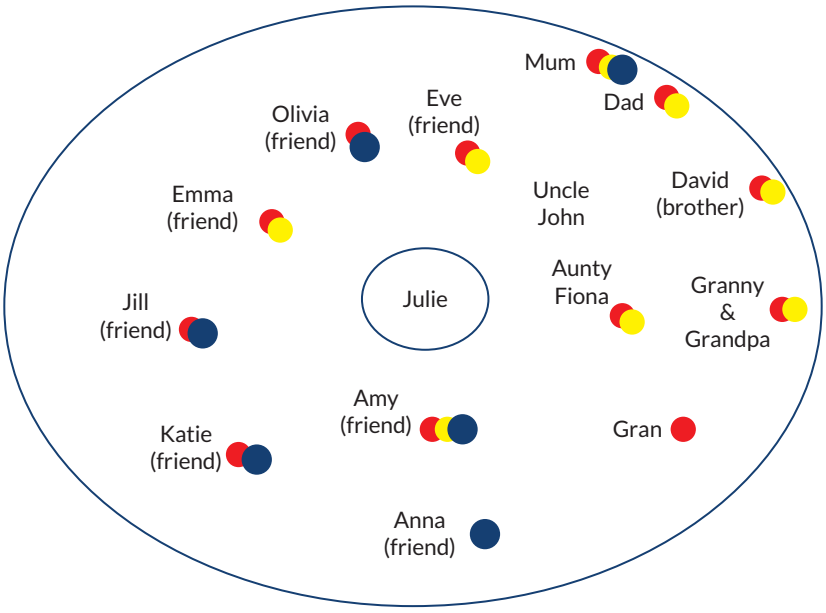

FIGURE 2 Sample sociogram.

these maps were revisited and different coloured dots were added to identify the people they had initiated a conversation with. Additional names of people who were not originally named in the training could be added at any stage. This represented a visual picture of message diffusion, which enabled us to calculate both the potential and actual extent of message diffusion. An example of a completed map is shown in *Figure 2*. As mentioned above, on day 2 of the training workshop, peer supporters brainstormed their friends and family and wrote their names down on their social network chart. They then placed a red sticky dot next to the individuals they felt they would be most likely to initiate a conversation with. At follow-up 1 (typically 2–3 weeks after the workshop), peer supporters were then asked to place a blue dot next to the names whom they actually initiated a conversation

about gambling with. If they had spoken to someone who was not originally on their chart, they were asked to write this person's name and relationship on the chart and also added the blue dot next to this new person. The same process occurred at follow-up 2, except peer supporters were given a yellow sticky dot to mark the conversations they had. This coloured dot system them allowed the team to assess potential conversations versus actual conversations had by peer supporters.

Recruitment and study set-up

Figure 3 presents a visual summary of the various steps required to set up the pilot study, recruitment (schools and students) and prepare for baseline survey completion. School recruitment was facilitated via an online information webinar for schools to find out more about PRoGRAM-A and what taking part would involve. The webinar invitation was cascaded to schools via the study teams' research network, with no restriction on school location or size. Once schools confirmed that they wanted to take part, a site visit was set up to discuss logistics. A memorandum of understanding was completed, detailing roles and responsibilities of the school and the research team as well as the planned timelines. This was agreed by schools and signed off by the head teacher.

All students in S3 (third year in secondary school, aged 13–15 years) at participating schools were eligible to take part. Prior to the study commencing, an information letter was sent home to parents/carers notifying them that their child's school was participating in the pilot study of PRoGRAM-A and giving them the option to 'opt-out' their

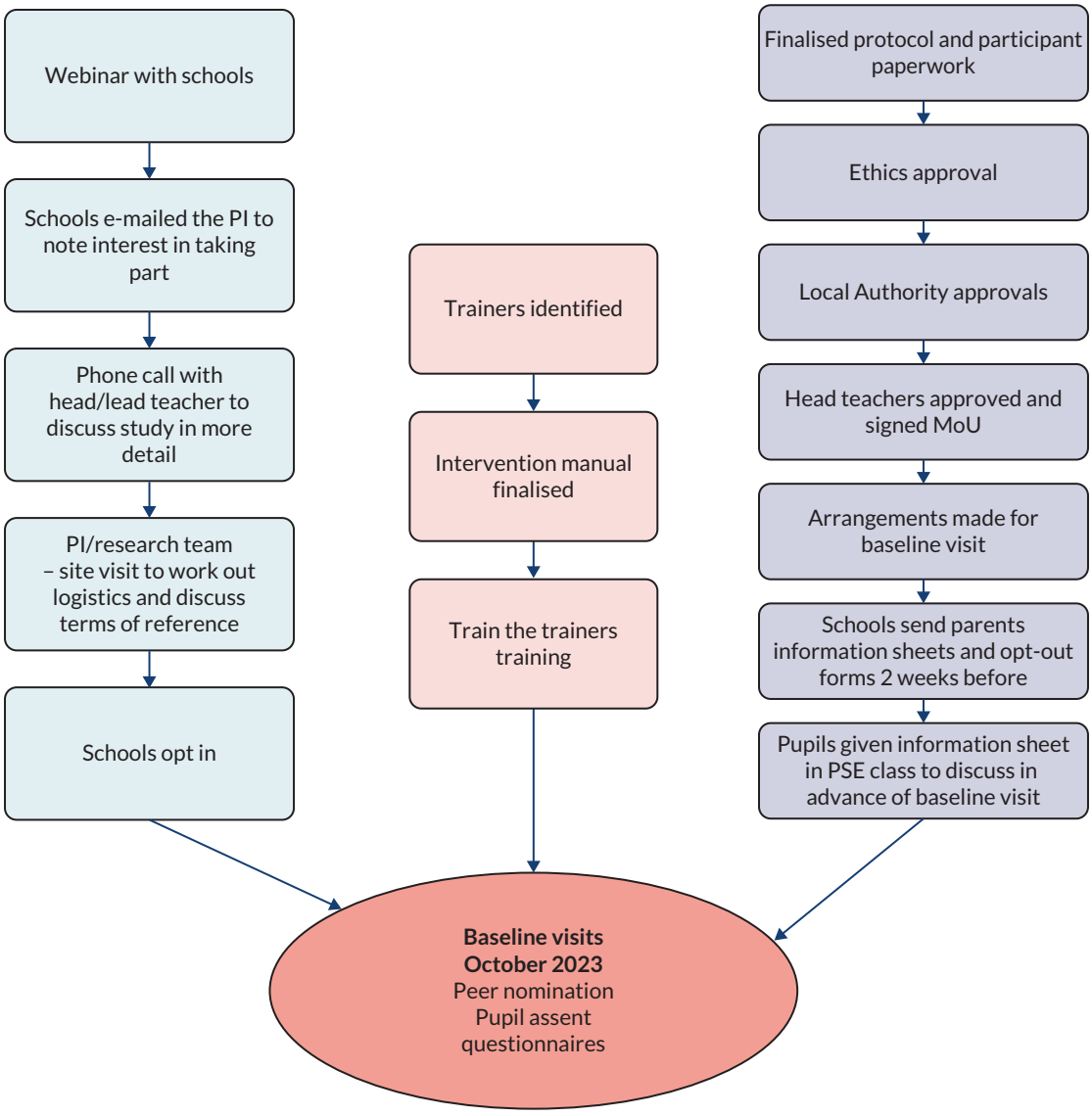

FIGURE 3 Study set-up and recruitment of schools. MoU, memorandum of understanding; PI, principal investigator; PSE, personal and social education.

child from taking part. Students were given a copy of the participant information sheet, and it was discussed with them in class before the baseline visit. Students then gave written signed assent on the day of data collection for the baseline survey. The process of securing written student assent was challenging and generated learning for future studies using a similar approach. This is discussed further in *The process evaluation indicates the intervention is acceptable to students and staff* and *Discussion/interpretation*.

The PRoGRAM-A trainers (with a background in youth work or education) were recruited by our third-sector collaborator, Evidence to Impact, who led intervention delivery.

Sample

Figure 4 shows the Consolidated Standards of Reporting Trials (CONSORT) diagram for the pilot trial. We assumed that the six participating schools would each have an S3 year group size in the range of 100–150 students. Assuming 85% baseline attendance and assent to participate gave a projected sample size of 510–765 students. This would have enabled the expected proportion of students completing the baseline questionnaire in a future trial to be estimated precisely [95% confidence interval (CI) width ± 2.3% to ± 2.9%]. However, of the six schools that took part in the study three were large schools with approximately 270–310 students in S3. This increased the sample size considerably and generated important learning for a planned future phase III cRCT.

Further details on the low completion rates at follow-up sessions can be found in *The student questionnaire was completed by 70% of students at both baseline and follow-up*.

Ethics and Local Authority approval

Ethical approval was obtained from the Edinburgh Medical School Research Ethics Committee (Ref-23 EMREC-016) along with Local Authority approval for all six schools. Final approval was obtained from the head teacher at each school.

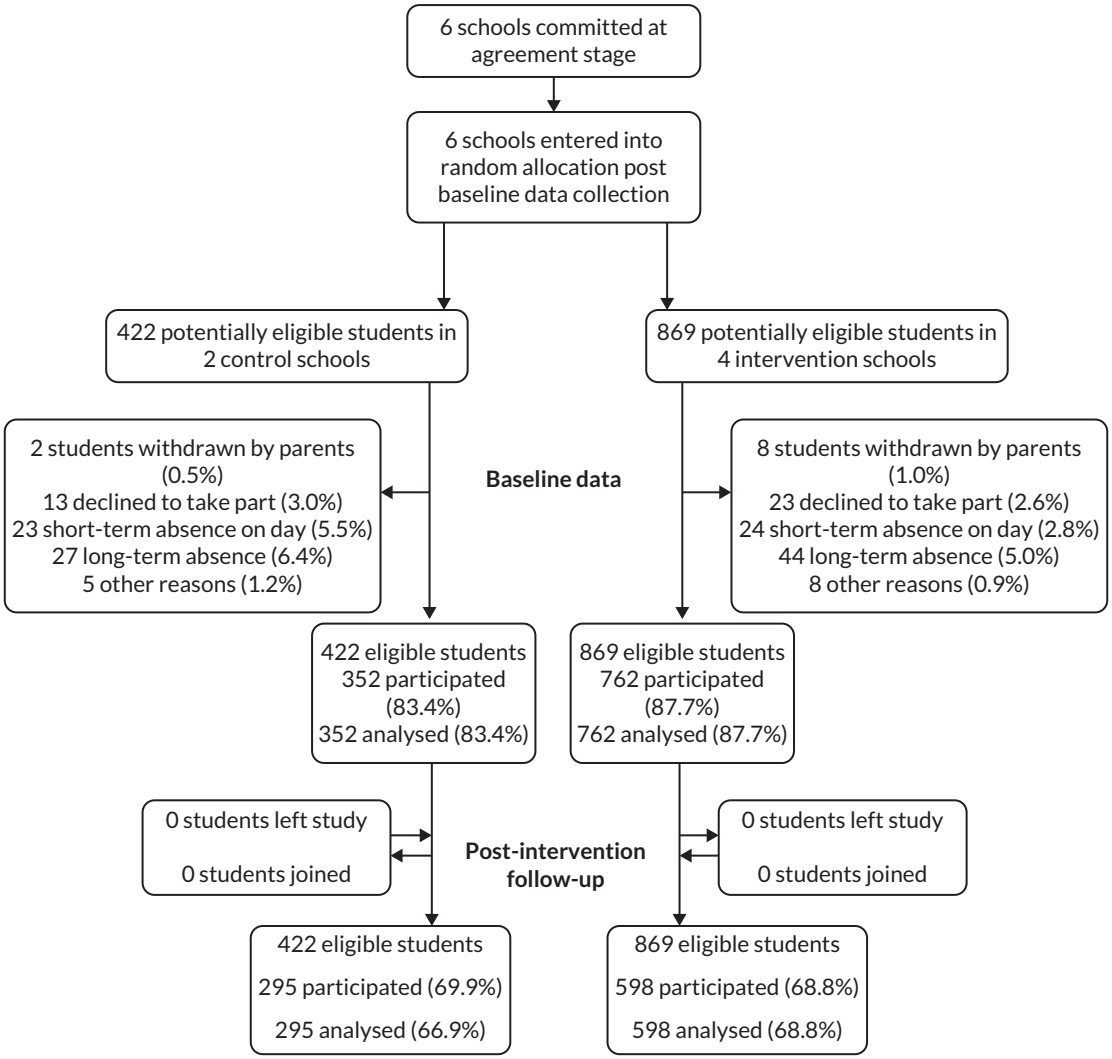

FIGURE 4 The CONSORT diagram.

TABLE 2 The PRoGRAM-A progression criteria

Progression criterion	Red	Amber	Green	Actual
1. Successful recruitment of six schools	< 6		6	6
2. Five schools remain in the pilot study	< 4	4	≥ 5	6
3. The intervention being delivered with 80% fidelity to the manual	≤ 69%	70–79%	≥ 80%	95%
4. The process evaluation indicates the intervention is acceptable to students and staff	Low	Medium	High	High
5. 70% of students complete the student questionnaire at baseline and follow-up	≤ 59%	60–69%	≥ 70%	69.2%

Analysis

Quantitative analysis

The primary analysis of the pilot trial aimed to determine whether the pre-specified criteria (*Table 2*) for the progression to a full-scale phase III trial were met. Analyses were primarily descriptive, providing estimates of recruitment, questionnaire completion and retention rates. Recruitment and retention of schools and students were summarised in a CONSORT flow diagram. We tabulated the demographic characteristics of students within settings by study arm (intervention or control) and overall using descriptive statistics. Frequencies and percentages (and exact binomial 95% CI) were reported for discrete outcomes, overall and by randomised group.

For each of the quantitative outcome measures on gambling participation at each assessment time point, data were summarised descriptively, and the proportion of missing data was reported overall and by randomised group.

As this is a pilot trial, not powered for effectiveness, no hypothesis testing was performed and no *p*-values were presented.

Qualitative analysis

Qualitative data generated through semistructured interviews and focus groups were audio-recorded, transcribed (with pseudonyms applied to transcripts) and coded. To assess the 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, recording written qualitative notes from the observer, was created to assess progression criteria 3. The aim of this observations was twofold. 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, it was an opportunity 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.

Progression criteria 4 were assessed via semistructured interviews (school staff, parents and carers, professional stakeholders and PRoGRAM-A trainers) and focus groups with peer supporters and non-peer supporters. Interviews and focus group discussions explored a number of items relating to the theme of acceptability – such as views on the acceptability of delivering PRoGRAM-A within a school setting; the acceptability of discussing the topic of gambling and GRH within the school curriculum; the acceptability of external trainers delivering the PRoGRAM-A content, alongside a peer delivery model; and indeed, school staff's willingness to delivery future cycles of PRoGRAM-A, should they be offered.

An inductive, thematic content approach was used to analyse the data[50] (including observational data), facilitated by NVivo 14 (QSR International, Warrington, UK). The transcripts were read by two members of the research team (MM and LN) to identify the key themes and sentiments that emerge from the data. A draft analytical framework was then created, piloted, refined and finalised by the research team. Each transcript was coded and summarised into key themes.

Social network analysis

Social network analyses evaluated the scope of the intervention in terms of reach (i.e. the potential and actual extent of message diffusion). It also explored the types of people peer supporters spoke to along with analyses of the likelihood of peer supporters talking to the people they predicted they would.

Two data sets were created. The first used data collected from the peer supporter sociograms (see *Collection of social network data* for more details on how sociograms were created) and the student baseline survey. Sociogram data were entered into Microsoft Excel® (Microsoft Corporation, Redmond, WA, USA) and were saved as a CSV file, with the peer supporter's name converted to their identification code for the baseline questionnaire to enable data matching. Analysis was undertaken in Stata® 18 (StataCorp LP, College Station, TX, USA) (StataCorp L.

College Station, TX: StataCorp LP; 2015. *Stata Surv data Ref Man release* 2020; 14).

The second database was created using data from the peer nomination forms and were entered into Microsoft Excel. Each peer nomination form was given a unique code, and each name on the form was traced and converted to the identification code they were given for the baseline questionnaire. Using Pajek (University's Faculty of Computer & Information Science, Ljubljana, Slovenia),[51] this was converted into a whole school year network to identify different communities of influential students in each school. An example of this network for one school is shown in *Figure 5*, with peer supporters in black and the rest of the year group in grey.

Health economics scoping study

Delivery costs for PRoGRAM-A (provided by Evidence to Impact, who led intervention delivery) were tabulated and summed to provide an estimate of the total programme cost per school. Average costs per student and per peer supporter were derived by dividing the average cost per school by the number of students and the number of peer supporters in said school recruited, respectively.

Papers from the literature review were examined for potential examples of applied methods, economic frameworks and/or economic outcomes that may be adapted for use in a future trial. The health economic scoping study focused on potential for cost–utility analysis (CUA), costs per quality-adjusted life-year (QALY), cost-effectiveness analysis (CEA, costs divided by some natural unit such as number of students who gamble) and cost–consequence analysis (CCA, costs presented alongside a wide range of outcomes). Patel and McDaid provide a summary of such frameworks (which they refer to as 'approaches') as relating to gambling which may provide useful context.[52]

Results summary

The following research papers are being synthesised in the results section of this synopsis report:

1. Preventing Gambling Related Harm Among Adolescents (PRoGRAM-A), a secondary school-based social network intervention: results from a pilot cRCT.
2. PRoGRAM-A: a mixed-method process evaluation.
3. Assessing biases in popularity methods for selecting peer supporters in schools: evidence from a GRH's intervention.
4. Mapping the diffusion of a school-based peer-led GRH's intervention in Scotland.

In this section, we present a summary of our research findings using the following headings: progression criteria; outcome measure for a future trial; key findings from the process evaluation; key findings from social network analysis and key findings from the health economic scoping study.

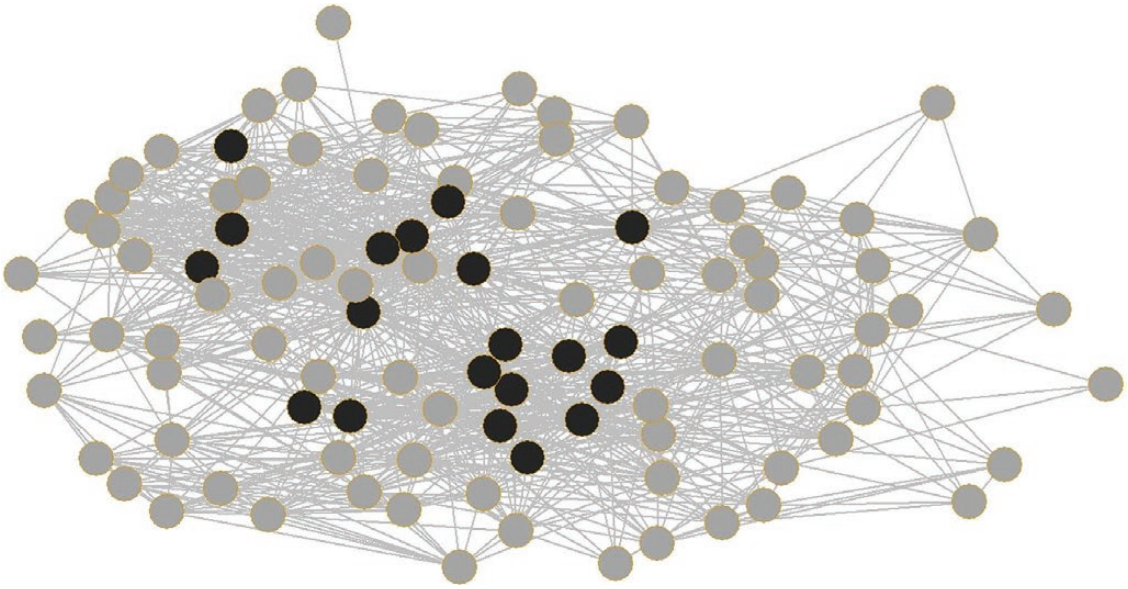

FIGURE 5 Example of a whole school community. Black dots represent peer supporters and grey dots represent other students in the school year group. Ties represent students who were both nominated by the same student at least once.

Progression criteria

As noted in *Quantitative analysis*, the primary outcome of this study was whether progression to a full-scale phase III cRCT was warranted and assessed via pre-set progression criteria. These criteria sought to address uncertainties in the intervention and cRCT design, with thresholds set according to a traffic light system. All criteria being green would indicate that the uncertainties were addressed and the study could progress to a full-scale evaluation. As illustrated in *Table 2*, all criteria were met and rated green, except criterion 5, which marginally fell into the amber category. However, as discussed further in *The student questionnaire was completed by 70% of students at both baseline and follow-up*, there are two ways to calculate this figure, one of which moves this progression criterion into the green category.

Successful recruitment of six schools

Six schools were successfully recruited. Once the study fieldwork was completed, all schools received a small financial reimbursement in recognition of the staff time to support the study.

TABLE 3 Intervention delivery and adherence to the manual activities

School 1	Green (100%)	Amber (80%)	Red (< 79%)
Day 1 training workshop			
Topic 1	2/2 activities delivered with adherence to the manual		
Topic 2	1/1 activity delivered with adherence to the manual		
Topic 3	3/3 delivered with adherence to the manual		
Day 2 training workshop			
Topic 4	4/4 activities delivered with adherence to the manual		
Skills/practice	5/5 activities delivered with adherence to the manual		
Follow-up sessions			
Follow-up 1	Sticky facts and social network maps completed		
Follow-up 2	Sticky facts and social network maps completed		
Follow-up 3	Sticky facts and social network maps completed		
School 2	**Green (100%)**	**Amber (80%)**	**Red (< 79%)**
Day 1 training workshop			
Topic 1	2/2 activities delivered with adherence to the manual		
Topic 2	1/1 activity delivered with adherence to the manual		
Topic 3	3/3 delivered with adherence to the manual		
Day 2 training workshop			
Topic 4	4/4 activities delivered with adherence to the manual		
Skills/practice	5/5 activities delivered with adherence to the manual		
Follow-up sessions			
Follow-up 1	Sticky facts and social network maps completed		
Follow-up 2	Sticky facts and social network maps completed		
Follow-up 3		Sticky facts and social network maps completed, but one trainer was absent which meant two peer supporter groups were combined into one large group. This affected quality of delivery	

Five schools remain in the pilot study

All six schools were retained for the full study duration.

The intervention being delivered with 80% fidelity to the manual

Intervention fidelity of the delivery manual was assessed using in-person-structured observations in two schools by the research team (MM, FD, AN and LN). From these observations, PRoGRAM-A trainer's adherence to the delivery of the training manual in 2-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 *Table 3*).

The process evaluation indicates the intervention is acceptable to students and staff

Teaching staff and students were very positive about PRoGRAM-A, suggesting that the intervention was acceptable. From a staff perspective, it was noted that gambling and GRHs were a growing concern and a topic that was highly relevant to students. This was reflected in teachers from both control and intervention schools reporting that they planned include gambling and GRH within the curriculum.

> *I would like to see it embedded in the PSE [personal and social education] curriculum now. We've started working on … we didn't want to … just because we were an intervention school, we kind of wanted to leave it alone and let what's happening this year happen and then leave the kind of … or maybe done again at the end. But we would certainly be looking to implement something going forward, yeah.*
>
> *Teacher 4, Intervention School*

Teachers also recognised the specific importance of countering gambling industry narratives and societal norms around gambling activities being fun. Teachers further reported that they felt they were not confident to address the topic within their current curriculum. They were, therefore, happy to have external experts come into deliver this work. This combined, with the minimal time required and no financial costs (to the school to take part in the pilot study), made PRoGRAM-A appealing.

Similar to teachers, interest in learning more about gambling and GRH was a common factor in student decision-making to become a peer supporter. This was followed by reports of curiosity concerning participation in the research process, the potential to add their involvement to their curriculum vitae and the opportunity to participate in an external training workshop, as reflected in the focus group discussion below.

> *Interviewer: Can you tell me a little bit about why you decided to take on that role [peer supporter]?*
> *Connie: I just thought it would be interesting, like learning about it and stuff.*
>
> *Anton: 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, Intervention School*

Additionally, students reported feeling proud to have been nominated by their year group to become a peer supporter.

Mode of delivery Teaching staff were enthusiastic about the peer-led delivery of PRoGRAM-A. Students taking ownership and responsibility for their own learning via the role of a peer supporter was felt to be a positive feature, with the associated social and leadership skills acquired through this process being highly valued by teachers. Delivery of PRoGRAM-A by external experts with youth work experience was recognised as an attractive feature, given their capacity to bring topics to life for students in a manner that teachers felt unable to replicate.

Peer supporters were equally enthusiastic about the external delivery of PRoGRAM-A, viewing the trainers as more friendly than teachers, with their interactions less formal. This dynamic contributed to the creation of a relaxed environment which facilitated peer supporter engagement in activities.

Student assent process for baseline survey The student assent process was challenging for students and was resource-intensive for the research team. The sponsor requirement that students complete a written consent form putting their initial in multiple consent boxes and then having to print and sign their name was not appropriate for this age group. It was common for students to tick, not initial, the consent box and several of them did not know what a signature or initial was. This resulted in multiple incomplete forms which required members of the research team to go back into school and complete

'mop-ups'. Alternative approaches to obtaining informed student assent are required.

The student questionnaire was completed by 70% of students at both baseline and follow-up

Each school provided a student class list which served as the sample file. However, after initial fieldwork visits, it became clear that these lists were outdated and did not reflect the true number of students that were eligible to part. The lead teachers at each school – primarily those responsible for Personal and Social Education, who were most familiar with the school year – reviewed the envelopes of pupils who were absent during the baseline data collection. They annotated the envelopes with reasons such as non-attendance or having left the school. They identified 71 students, in the school class lists at baseline, who had either left or were not attending school and were not eligible to take part. Statistical analysis of the student survey completion was therefore calculated in two ways. First, using the original sample file (*n* = 1291), which resulted in a completion rate of 69.2% for both baseline and follow-up questionnaires. Second, using the amended sample file (*n* = 1220), removing the 71 students not attending school increased the completion rate to 73.2%.

In a full-scale study, we will ask these lead teachers to review the pupil list provided by the school administration team in advance of data collection to ensure greater accuracy and minimise discrepancies.

The low response rate at follow-up, presented as missing data in *Table 4*, was mainly due to unforeseen end-of-term events at some participating schools. These events were not anticipated by the study's designated contact teachers, leading to reduced pupil availability on the scheduled data collection day. A mop-up session was possible at one school; however, this could not be arranged at the other due to time constraints at the end of term. At that school, only for half the year, the group was present as a result of the conflicting event. In the full-scale study, follow-up will take place at 12 months rather than 6 months and will be

TABLE 4 Gambling behaviour at 4 weeks and 12 months

	Allocation		
	Intervention, *N* = 762	**Control, *N* = 352**	**All, *N* = 1114**
Baseline			
Self-reported gambling last 4 weeks			
Yes	367 (48%)	134 (38%)	501 (45%)
No	394 (52%)	217 (62%)	611 (55%)
Missing	1	1	2
Self-reported gambling last 12 months			
Yes	599 (79%)	255 (73%)	854 (77%)
No	162 (21%)	96 (27%)	258 (23%)
Missing	1	1	2
Follow-up			
Self-reported gambling last 4 weeks			
Yes	258 (43%)	99 (34%)	357 (40%)
No	340 (57%)	196 (66%)	536 (60%)
Missing	164	57	221
Self-reported gambling last 12 months			
Yes	483 (81%)	216 (73%)	699 (78%)
No	115 (19%)	79 (27%)	194 (22%)
Missing	164	57	221

scheduled during defined periods in the academic year to minimise the risk of similar disruptions. We will also ask school contacts to proactively check for and confirm any potential scheduling conflicts in advance.

Data entry was outsourced to an approved third-party company – Adetiq Ltd (Brighton, UK). This service was time efficient, with data entry completed at a reasonable cost and to a high standard.

Outcome measure for a future trial

As stated in *Methods for data collection and analysis*, the primary outcome measure for this pilot cRCT was whether progression to a full-scale phase III cRCT was warranted. Given that all of progression criteria were met, the Trial Steering Committee (TSC) has confirmed their support for the research team to prepare a funding application for a phase III cRCT.

The proposed primary outcome for a future phase III cRCT was self-reported gambling participation. *Table 4* shows gambling participation in the last 4 weeks and in the last 12 months in the control and intervention groups at baseline and follow-up. Pilot study findings found no indication of differences between the control and intervention groups or the baseline and follow-up data. This is mostly likely due to the small number of schools included in the pilot study. It is also important to note that the follow-up period for the pilot study was 6 months, not 12 months. Thus, the time period was not long enough to show any change.

However, the observed small increase among respondents for gambling in last 12 months in intervention schools (79% baseline, 81% follow-up) may have been caused by an increased appreciation of what constitutes gambling. Given the observed decrease in gambling in the last 4 weeks, it is plausible activities which were described, but not perceived by students as gambling in the baseline, were being included at follow-up survey completion. However, due to this being a pilot trial which was not powered for effectiveness, this is merely speculative. Despite this, it would be appropriate to give further consideration of how gambling participation is measured in a future trial. For example, asking a more specific question, such as spending their own money gambling which would record more harmful types of commercial gambling (e.g. machine gambling and sports betting) rather than any type of gambling, which would include relatively low-risk gambling such as playing cards or penny pushers in an arcade.

Key findings from the process evaluation

In this section, we report key findings from the PRoGRAM-A process evaluation with a particular focus on three key themes:

1. PRoGRAM-A relevance and motivation to take part
2. Peer-based learning
3. PRoGRAM-A refinements.

Preventing Gambling Related Harm in Adolescents relevance and motivation to take part

Teachers were asked to describe the factors that influenced their schools' decision to sign up to the PRoGRAM-A trial. For some, while the topic of gambling had been addressed in ad hoc ways in the past (primarily delivered to senior students, e.g. third-sector organisations delivering one-off plays on gambling harms), the topic was not fully embedded within their curriculum. Others reported that the issue of GRH had already been identified as an issue for their students, which contributed to their decision to become involved in PRoGRAM-A. Despite all reporting that gambling and GRH was a topic that they would like to address within their Personal, Social, Health and Economic (PHSE) programme, at the time of enrolling in PRoGRAM-A, neither control or intervention schools had embedded any sustained lessons with their PHSE curriculums. Signing up to PRoGRAM-A, therefore, allowed schools to address this gap.

> *… gambling is a missing part of our Personal Social Education programme and with the best will in the world … you know, we lose sleep at night-time thinking about what we should be developing in the programme. And it's one of these things, it's not like teaching a normal subject where that is your focus. So our focus is basically fire-fighting a lot but supporting the students and liaising with partner agencies etc. … So it's always, when you see something like that, the opportunity to get involved.*
>
> *Teacher, T2, Control School*

> *The hook for me was the fact that we'd identified this as a particular issue that was starting to affect more young people so I was interested to find out a wee bit more about it. But as soon as I did the Teams meeting, the kind of webinar that Fiona did with the information on gambling and gambling statistics and the marketing, I was very, very interested.*
>
> *Teacher, T4, Intervention School*

Stakeholders (see *Table 1* for types of stakeholder) also supported the need for educational interventions to not only increase awareness of gambling harms among young people but also to disseminate early preventative messaging among younger students, while raising critical awareness of the many forms of 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.

The importance of early messaging to prevent future engagement in gambling and GRH was recognised by teachers, PRoGRAM-A trainers and stakeholders. The practice of early preventative messaging was noted to exist for other PHSE topics such as sexual health, vaping and tobacco, alcohol and drug misuse. The view was therefore that early preventative messaging should be extended to address gambling and GRH within the PHSE curriculum.

While initial discussions with students tended not to frame gambling as being particularly relevant to them, when asked about their knowledge and awareness of gambling, gambling websites/companies, gambling advertising and marketing, students drew upon their exposure to gambling content and advertising/marketing within their local communities and online environments.

> *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*

Despite initial reservations about the topic of gambling and GRH, when asked why students agreed to take on the role of peer supporters, students reported being keen to learn more about the topic. While teachers were supportive of addressing the topic of gambling and GRHs within the school curriculum, some felt that they did not have the time or capacity to fully engage with the topic to allow them to confidently develop the topic within their current curriculum. PRoGRAM-A was, therefore, reported to be an attractive educational resource. Among stakeholders, acceptability of the PRoGRAM-A intervention was discussed in relation to its impartiality. This point was particularly salient, given the lack of non-industry-funded preventative educational interventions within the UK, as illustrated in the comment below.

> *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. Because of the evidence, I suppose, not just from gambling but from other sectors, which shows that however apparently independent those industry-sponsored programmes are or however apparently neutral they are, the evidence suggests that there is still … a significantly increased odds of uncertainty … compared to non-industry messaging.*
>
> *Stakeholder 4*

In addition to commenting on the robust development of the PRoGRAM-A resources, and content being tailored to young people, teachers were keen to collaborate with external agencies in the delivery of their PHSE programmes. They recognised that external agencies had the ability to 'bring topics to life' (T1, Control School) for students in a way that teachers were less able to within traditional classroom settings. A similar view was expressed by peer supporter family member.

> *I think it's a good idea, 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*

This view was further 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 that their interactions with youth workers were less formal in comparison. This dynamic contributed to the creation of a relaxed and non-judgemental environment which facilitated peer supporter engagement in activities.

> *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.*
>
> *Anton, peer supporter, FG1*

Peer-based learning

In addition to working alongside external agencies to deliver part of the PHSE curriculum, teachers were enthusiastic about peer-based approach to learning. They valued the role of peer learning models, which were viewed positively as an opportunity for students to take ownership and responsibility for their own learning, as well as allowing students to acquire associated social and leadership skills through their involvement in PRoGRAM-A. Peer supporter family members were equally enthusiastic about their children's participation in PRoGRAM-A, particularly in relation to the social skills and confidence building that they acquired through the training workshop and engaging in message diffusion with their friends and family.

Stakeholders were broadly supportive of PRoGRAM-A's delivery mode. They recognised that the combination of external trainers (youth workers) alongside peer education methods had the potential to increase the salience of the topic for young people while also destigmatising any conversations that young people may have around gambling – making them more likely to engage with the content. However, there was a concern around the safeguarding of peer supporters, specifically when engaging in potentially sensitive conversations with their social networks, but there was also recognition that the role of peer supporters was not to counsel or identify harms among their networks.

Preventing Gambling Related Harm in Adolescents refinements

Peer supporters enjoyed the interactive and engaging activities within the training workshop, which took place in a venue outside of school grounds.

> *Yeah, it [workshop] 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*

The follow-up sessions, however, ran within school classrooms and were time-limited to one class period. Feedback from students suggested that follow-up sessions were less engaging than the workshop. Further refinements to the delivery of follow-up sessions should consider ways of making the sessions more engaging by allowing more time for an interactive group work. Students engaged well with the topic of gambling and GRH. However, some felt that gambling harms would be more realistic and relatable if they were presented with real-world/lived experience examples within the materials and resources delivered across the 2-day training workshop, as illustrated in the comment below by one peer supporter:

> *I felt like the major harm examples of what could happen. Because there was a lot of like the facts and the percentages but it wasn't like … there was a few instances of stories but I felt I needed more of that.*
>
> *Anton, peer supporter, FG1*

Incorporating examples of lived experience was also raised by peer supporter's family members. To avoid situating gambling and gaming as a topic that is only relevant for boys, further minor refinements to the PRoGRAM-A manual should ensure that the intersection of gambling and gaming is made more salient for girls.

While peer supporters felt confident about having conversations with friends and family at the end of the 2-day training workshop, it was clear from focus group discussions that peer supporters found it more challenging to engage their friends in natural conversations about gambling than adults (such as family members, who they found it easier to share the facts they had learned during training). The training manual could refine the social skills practical sessions to better support peer supporters to manage conversations with young people their age, which may be more challenging to engage with. Specifically, the social skills activity could focus on providing more support in terms of helping peer supporters to identify ways of discussing the topic of gambling and GRH in ways that are most relevant for young people.

Despite teachers being overwhelmingly positive about the planning and organisation of PRoGRAM-A, trainers experienced challenges of co-ordinating students and liaising with other teaching staff. For progression to a full-scale trial, it would be beneficial to have the role of link teacher shared between two members of staff, particularly in larger schools and to ensure continued cover for a longer trail.

Key findings from social network analysis

Analysis of the peer supporters' social network maps found that self-reported message diffusion was high. As *Table 5* shows, peer supporters predicted having 1323 conversations, but actually had 1555, representing 17.5% more people than they anticipated. They spoke, on average, to 2.4 caregivers or siblings, 1.6 other family members and 6.9 people outside their family. In training, peer supporters were asked to predict who they would speak to. We found 68% of the predicted conservations

TABLE 5 Message diffusion, by type of connection and whether conversation was predicted

	Care givers or siblings	Other family	Non-family	Total
Predicted conversations	316	268	739	1323
Actual conversations	343	224	990	1555
Percentage of predicted conversations which happened	81%	46%	71%	68%
Percentage of conversations with people not nominated in training	25%	45%	42%	42%

took place, with 42% of all conversations with people not mentioned in the training. This is an important finding illustrating the strength of using sociograms to create scaffolding that allowed peer supporters to proactively target individuals within their networks and have the confidence to expand beyond this.

Key findings from the health economic scoping study

Direct implementation costs of Preventing Gambling Related Harm in Adolescents

When reviewing the direct costs noted below, it is important to note that they are speculative at this pilot phase of the research and are only intended as a guiding approximation. Of equal importance is the consideration of factors or items (as set out in the 'Activity' column in *Table 6*) that may need detailed costing in follow-up research.[53]

Table 6 presents the average delivery cost to funder of PRoGRAM-A for a hypothetical roll-out for 2 groups of up to 30 peer supporters (sharing 1 coach) of PRoGRAM-A delivered in 1 school (based on assessment of costs from 2 intervention schools with a total of 296 total students and 42 peer supporters). The total estimated cost was £8313.00. This equates to an average delivery cost per school student of £28.08, and £197.97 per peer supporter, dropping to £138.55 at the maximum of 60 peer supporters.

Notable uncertainties include:

1. The cost per day (£232) of trainers may differ in practice. NHS staff may be slightly cheaper being paid £18/hour,[55] or £126 for a 7-hour day before on-costs. Assuming 75% on-costs would total £220.50 per day, or 100% would be £252 per day. Comparable figures for youth workers (£15/hour salary)[55] comes to £105 (0% on cost), £183.75 (+ 75% on cost) and £210 (+ 100% on costs), respectively.
2. Venue hire may vary considerably between sites. The value above is included as an exemplar only.
3. Milage budgets for trainers are likely to vary between sites.

While total costs stated here are only intended to be illustrative, and are subject to a number of assumptions, the activity list has been carefully scoped. A future trial may be able to offer a range of estimates by repeating this process in all, or at least a large sample/variety of sites. This would benefit from grouping schools into a range of exemplar scenarios (e.g. rural vs. urban, categories of distance from trainers, nature/price range of venue hired and staff salaries) to capture contextual nuances.

TABLE 6 Base case indicative direct implementation costs per school for a hypothetical roll-out of PRoGRAM-A (2023–4 prices)

Activity	Price (£)	Unit	Quantity/notes	Cost (£)
Peer nomination	232.00	Per trainer/day	Two trainers, 1 day each One trainer, 1.5 days	812.00
Recruitment	232.00	Per trainer/day	Three trainers, 0.5 day each	348.00
Peer support training	232.00	Per trainer/day	Six trainers, 2 days each	2784.00
Follow-ups (× 3)	232.00	Per trainer/day	Seven trainer sessions, 0.5 day each	812.00
Coaches	650.00	As invoiced	One used for peer support training	650.00
Venue	405.00	As invoiced	One used for peer support training	405.00
Catering	1245.00	As invoiced	One used for peer support training	1245.00
Printing and resources	297.50	Budget	£350 budget[54] reduced by 15%[55] for expected economies of scale	297.50
Trainer mileage	0.45	Per mile	Budget (assumed)	500.00
Lead trainer admin time	232.00	Per trainer/day	Approx. 1 day total	232.00
Administration time	15.00	Per hour excludes on-cost	Assumed 3.5 hours per week, per 12 schools	227.50
			Total	**8313.00**

Sources
All items are sourced from Evidence to Impact, intervention delivery leads.

Identification of health economic outcome measures for use in future phase III cluster randomised control trial

Analysis of stakeholders interviewed (from the process evaluation) emphasised the importance of having evidence to support the effectiveness of an intervention. However, ideas concerning what evidence stakeholders would be convinced by were not forthcoming with little to no overlap in outcomes mentioned. Nevertheless, some items had similarities with items on the existing trial data collection (participation numbers, reach of the intervention, knowledge of gambling and degree of gambling participation), adding reassurance that a cost–consequence report using existing methods would have some merit.

A recent review of gambling harms by Public Health England (PHE)[56] identified the following categories of harms:

- financial
- relationship disruption, conflict or breakdown
- mental and physical health
- cultural (tension between gambling and cultural practices and beliefs/norms)
- employment and education
- criminal activity.

The report includes estimates of prevalence, government costs and societal costs associated with people who exhibit problem gambling for each of these categories where available.[9] However, the costing report underpinning these was unable to disentangle specific costs caused by gambling itself from other life factors such as mental health.[57] Nevertheless, the inclusion of these categories in the report would at least imply an interest in their reduction. The cost estimates themselves are driven by a combination of hard outcomes:

- homelessness
- depression
- alcohol treatment
- illicit drug use
- suicide
- lost/missed employment and education
- criminal justice costs.

These are not measurable without follow-up into adulthood, though the report identifies several expected risk factors for problem gambling which may be used in surrogate (impulsivity, substance misuse, being male, depression, participation in gambling, already experiencing problem gambling, violent behaviour, poor academic performance and peer influence). Of these, PRoGRAM-A may be able to directly modify:

- participation in gambling
- peer influence (having peers who gamble).

Economic framework

Examples of CUA are available.[58–60] Lower health utility scores (which underpin QALY calculations)[53] are associated with increasing severity of problem gambling.[58,59] Unfortunately, attempts to isolate any specific impact of gambling alone by controlling for other life factors were inconclusive due to underpowering.[58] This suggests a need to follow-up students into adulthood before such differences manifest, if at all, rendering CUA impractical.

Few economic evaluations were found, which related to peer-/school-based, social network behavioural change interventions similar to PRoGRAM-A. The closest being that of the ASSIST programme which PRoGRAM-A was informed by.[39] This takes a CEA approach, from a programme funder perspective, estimating: (1) a cost per pupil and (2) a cost per pupil not smoking at 2 years, accounting only for programme implementation costs. Cost-effectiveness statements are made subjectively via comparison to an existing CUA model with comparable costs and rates of anticipated smoking.[39] Unfortunately, no such similar external benchmark criteria were located for gambling harms.

Noting that both the PHE report and the CUA literature experienced issues disentangling gambling costs and health impacts from comorbid conditions,[57,58] the next best option appears to be a primary CEA, from a programme funder perspective, of a high-priority outcome with a subjective interpretation. The strongest evidence located suggests value in this being based on the modifiable risk factors identified in the PHE report (personal participation in gambling and peers who participate in gambling). These could be combined and simplified to rates of gambling among students within the school to estimate a measure of costs per reduction in (immediate-term) gambling. This would benefit from providing as much additional context as possible alongside CEA estimates CCA style to aid this interpretation, given the lack of long-term outcomes. Such an approach is similar to a Social Return on Investment (SROI) approach, without placing financial values on all outcomes and placing higher emphasis on the rates of gambling. CEA is preferable over SROI as the outcomes being reported (including rates of gambling) are not hard outcomes in themselves but rather surrogates for long-term gambling-related health.

For example, where a SROI may include, for example, rates of criminality and associated societal costs as a means to value it, presenting this in financial terms may give the appearance that the outcome is more precise than it really is. CEA, with additional factors presented alongside it, adds a degree of transparency to reporting. Though if very long-term follow-up was possible, SROI may become viable.

Discussion/interpretation

A pilot cRCT of the PRoGRAM-A intervention was conducted to decide whether progression to a full-scale phase III cRCT was warranted. All five progression criteria were met. All schools were recruited and retained in the study and there were low levels of missing data on outcomes. The process evaluation indicated that PRoGRAM-A was acceptable to multiple stakeholders and delivered with fidelity to the delivery manual. This suggests that progression to a full-scale cRCT of PRoGRAM-A is warranted.

Feasibility of the pilot trial design

For the progression criteria relating to the acceptability of the cRCT design, all settings were recruited and retained at follow-up. The student-level response rate at baseline and follow-up was 73.2% after removing from the denominator students who were absent from school long term. While this met the progression criterion, we only had costed for two follow-up visits to schools. Increasing the number of fieldworkers attending each setting and making more visits are likely to increase student retention.

Adaptations to the Preventing Gambling Related Harm in Adolescents intervention

The process evaluation identified minor refinements that could be made to the PRoGRAM-A before it is tested further. These include making intervention activities more engaging by including more real-world examples of the effects of gambling and reducing the number of follow-ups.

Adaptation to trial processes

The student consent process was not appropriate for this age group. Students did not understand what initials or signature were leading to consent forms to not be completed correctly. Alternative approaches, such as only requiring students to tick boxes or verbal consent, need to be explored. To increase student retention rates, a larger dedicated team of field workers will be required for a future phase III trial, who can conduct baseline and follow-up surveys. The question to measure the primary outcome measure may need to be more specific, such as spending their own money gambling.

Adaptation to future primary outcome measure

Consider a more focused question to address the primary outcome measure – reduction in gambling prevalence – such as spending their own money gambling which would record more harmful types of commercial gambling (e.g. machine gambling and sports betting) rather than any type of gambling, which would include relatively low-risk gambling such as playing cards or penny pushers in an arcade.

Recommendation for future health economics study

A future phase III RCT should:

1. Repeat the direct implementation costing exercise in a range of schools to provide several exemplar scenarios of programme cost structures in different contexts where they are expected to differ (e.g. small vs. large and/or rural vs. urban schools). This should include some allowance in cost-structures to 'buffer' against uncertainty. This could be a fixed percentage increase explored with sensitivity analyses;
2. Ideally present the primary economic analysis in terms of costs per rates of student gambling. These are to be presented in addition to cost–consequence style reporting of total costs alongside broader trial outcomes.

Contribution to knowledge

This pilot study has contributed to existing knowledge in two ways. First, as noted above, it has provided essential information to inform a future funding application to conduct a phase III RCT. Second, it has made a broader contribution to the field of social network science both in terms of social network intervention design and social network analysis using egocentric sociograms.

Strengths and limitations

This study has many strengths, one of the most important is that PRoGRAM-A is one of the first independently research funded interventions to prevent gambling harm in adolescence. Existing gambling industry-funded education/prevention interventions for young people are criticised for lacking independence, appropriate development and programme theory.[48]

A further strength is that PRoGRAM-A is grounded in, and guided by, existing intervention development and evaluation guidelines,[61] with consistent patient and public involvement (PPI) input to inform manual content and delivery. We employed a robust and rigorous mixed-method process evaluation, consulting with a range of stakeholders and also included a social network analysis component and a health economic scoping study.

PRoGRAM-A helps contribute to an environment where young people become critically aware of the gambling industry as well as the many activities that constitute gambling behaviour. PRoGRAM-A has the potential to be a valuable component in a wider prevention strategy and legislative change to prevent GRH. Shifting perspectives of the acceptability of gambling and gambling-adjacent behaviours will in turn contribute to a societal-wide denormalisation of gambling.

A limitation is student self-reported gambling behaviour. This relied on their interpretation of what gambling is, which, as our process evaluation has shown,[1] varied.

This research study has benefited greatly from broad range of stakeholders who contributed to the study in several ways: for example, members of the Trial Management Group, TSC and the young person's PPI group. From an institutional perspective, this study has strengthened existing and created new links with multiple universities and a range of stakeholders from the public and third sector.

Patient and public involvement

Patient and public involvement was a central feature of the research design, with young person engagement and feedback sought throughout the study. CM and MM, coinvestigators on the study, led on the PPI work with a young person's Public Advisory (PA) group. *Table 7* provides an overview of the composition of our young person's PA panel and a breakdown of the PPI sessions.

The young person's advisory group (YPAG) comprised of between four and eight young people between the ages of 10 and 15 years. Throughout a period of 18 months, June 2023–November 2024, the YPAG engaged in sessions that were led by CM and his colleagues. The sessions were observed by one member of the research team. Observation notes were recorded on an observation, which captured feedback from the YPAG and edits/updates required for the intervention delivery manual.

Seven young people, including members of the YPAG, contributed to the adaptation of the Attitudes to Gambling Scale (8 refers to 8 questions included in the scale) (ATGS-8) gambling attitudes scale. In a semistructured group session, the researcher reviewed each question of the ATGS-8 scale in detail, noting the participants' understanding and how they interpreted the questions. They also discussed alternative wordings to improve clarity and make the questions more comprehensible. A second session was held with the young people to review the newly adapted scale and confirm their understanding.

Impact and dissemination

The young people provided comments on the relevance, clarity and ordering of activities, the colours and font size of the website and the routing and wording of the questionnaire. The research team then made appropriate adjustments to study documentation and fine-tuned aspects of the manual content to ensure that the materials were both accessible and relevant for young people. An example of manual refinement was PPI group feedback on the gambling marketing activities. After consultation with the PPI panel, it was felt that gambling marketing and advertisements were too abstract a concept for young people. Instead, the final activity within the marketing and advertisement topic, which required the peer supporters to critique a series of real gambling advertisements, was moved to the first activity within the topic. Students were presented with laminated examples of Mecca Bingo, BetFred, National Lottery and Bet 365 advertisements, which in turn allowed them to grasp the concept of gambling advertisements and critique these advertisements in terms of who they may be targeted at, provided peer supporters were equipped with the foundational knowledge and understanding of what was meant by gambling advertisement and marketing. This then allowed peer supporters to progress on to the activities critiquing influencers and industry spending on gambling marketing. In addition to feeding into the manual development and delivery, the young people also reflected upon their experiences of being part of the PA panel, which was recorded and embedded within the stakeholder webinar event.

Teaching staff involvement in patient and public involvement

In addition to the young person's PA group, we invited one member of a secondary school's Senior Management Team/staff teacher to participate in the TSC. We identified this member of teaching staff through our existing research relationship with this school. Involving a member of teaching staff within the TSC allowed the Trial team to also make relevant adjustments to the study materials and study procedures throughout the study period to ensure that they were appropriate for delivery within school settings.

Equality, diversity and inclusion

Language and terminology

The language used in the questionnaires was reviewed by the young people's PPI group to assess if the terminology was accessible to this age group.

TABLE 7 Overview of PPI sessions with young person's PA panel

Who	Recruitment	Stage of research	PPI sessions	Location
Group of 4 young people aged 10–15 years	Young people recruited via a youth person's social enterprise club run by coinvestigator CM	Prior to delivery of PRoGRAM-A	June–August 2023	Larkhall Universal Connections – Tuesday evenings 6–8 p.m.
PPI session	**Content**		**Description**	**Date**
1 – manual content	What is gambling	Prior to delivery of PRoGRAM-A	Panel worked through content and provided feedback on the topic of 'what is gambling'	20 June 2023
2 – manual content	Gambling and gaming	Prior to delivery of PRoGRAM-A	Panel worked through content and provided feedback on the topic of 'gambling and gaming'	27 June 2023
4 – manual content	GRH and identifying risks	Prior to delivery of PRoGRAM-A	Panel worked through content and provided feedback on the topic of 'gambling-related harm and identifying risks'	11 July 2023
3 – manual content	Gambling advertising and marketing	Prior to delivery of PRoGRAM-A	Panel worked through content and provided feedback on the topic of 'gambling advertising and marketing'	18 July 2023
5 – website and research docs	Website and research materials	Prior to delivery of PRoGRAM-A	Panel worked through content of the PRoGRAM-A website and provided feedback on research materials such as PIS and CF, topic guides and so on	25 July 2023
6 – pupil survey	PRoGRAM-A baseline/follow-up survey	Prior to delivery of PRoGRAM-A	Panel worked through the PRoGRAM-A pupil survey	20 November 2023
7 – feedback on Young Person PA group involvement	PA group feedback	After delivery of PRoGRAM-A and analysis of summary findings	Panel provided feedback on their involvement in the PA panel for PRoGRAM-A	Winter/spring 2025
8 – future survey component	Feedback on adaptation of an existing scale to measure young people's attitudes towards gambling	Future planned phase III cRCT	Panel reviewed existing set of questions and discussed any changes required to make them relevant for their age group	19 November 2024
Young people skills development	**Type of award** Young people involved in the PA group received a certificate for their involvement in the PRoGRAM-A PPI work			
PRoGRAM-A certificate				
Contributions to the PPI PA group	• Food and beverages were provided for each PA session • The youth group received £500 for their involvement in the PPI sessions. This money allowed the organisation to fund activities for the young people who access their services			

Generalisability and transferability of evidence

The pilot study schools included rural as well as urban schools, Roman Catholic as well as non-denominational schools incorporating variation across the range of Scottish Index of Multiple Deprivation (SIMD) levels. However, as the intension of this pilot study was to explore the intervention acceptability, feasibility and progression to a phase III cRCT, we only included six schools in Scotland. This sample was not intended to provide findings that are generalisable. The evidence produced does provide insight and learning that will inform a future funding application to conduct a fully powered cRCT that will generate transferable and generalisable evidence.

Participant representation

Socioeconomic status

Most of the schools taking part were in the central belt of Scotland incorporating urban and rural environments. Half the schools had a school roll of over 1500 students, with the smallest school roll being around 650. There was considerable social demographic variation between,

and within, schools due to school catchment areas. The surrounding area of four of the schools included areas of highest deprivation (SIMD deciles 1 and 2). All schools had some surrounding areas in the least deprived sector (SIMD 8–10).[62]

Due to issues of confidentiality, we did not collect post code data on students. In the questionnaire, students were asked if they received free school meals (Yes 6.8%, No 81.1% and Don't know 12.1%) and whether anyone in their home was in any kind of paid employment (Yes 89.8%, No 3.7% and Don't know 6.5%). This information along with the SIMD data for the surrounding areas indicated that the study population showed good variability in exposure to socioeconomic disadvantage.

Ethnicity

The questionnaires requested that students indicate their ethnicity. These data were then compiled and compared with the 2022 Scottish Census data for ages of 0–15 years.[63] The ethnic composition of the study population closely mirrored that of the general Scottish population in the 0–15-year age group, revealing a slightly greater ethnic diversity within the study group (see *Table 8*).

Children with additional support needs

Schools solely for children with special needs were not included in the study. However, students in mainstream school with additional support needs (ASN) were included and encouraged to take part.

We offered schools the option of electronic questionnaires for ASN students; however, none of the schools took up this offer. The support given to students with ASN varied greatly between schools. Some schools provided 1 : 1 teacher support to assist some students with completing the forms and questionnaires, and in some schools the support was minimal if provided at all.

The research team had asked about numbers and names of ASN students so that issues could be addressed in advance, but some schools were reluctant to give out this information due to confidentiality issues. We therefore had to rely on the teachers supporting the relevant students, which worked well. However, for a future definitive study, further discussion with the schools in advance is required to ensure that these students have sufficient support to take part.

Gender

The questionnaires asked students to indicate their gender, offering options for 'Boy' or 'Girl', as well as allowing for self-identification and the choice to decline answering. The percentage of students identifying as a boy was 44.9%, girl was 52.4%, another identity was 1.0%, and 1.7% did not want to answer the question. Sexual identity was not included in the question, as it was felt inappropriate for the age of the students.

Participant confidentiality

The questionnaires were voluntary and students did not have to answer any questions that they were uncomfortable with and could withdraw at any time.

TABLE 8 The PRoGRAM-A baseline questionnaire data – ethnicity

	PRoGRAM-A			
	Control (*N* = 252) (2 schools)	Intervention (*N* = 762) (4 schools)	All (*N* = 1114)	Scotland 2022 Census[63] (%)
White British (including White, British, English, Scottish, Northern Irish)	227 (65.2%)	644 (85.2%)	871 (78.9%)	88.2
White not British	42 (12.1%)	20 (2.6%)	62 (5.6%)	
Asian or Asian British	34 (9.8%)	35 (4.6%)	69 (6.3%)	5.5
Black or Black British	5 (1.4%)	15 (2.0%)	20 (1.8%)	
Caribbean or Black				0.1
African				2.1
Mixed/multiple ethnic backgrounds	22 (6.3%)	22 (2.9%)	44 (4.0%)	2.8
Other	18 (5.2%)	20 (2.6%)	38 (3.4%)	1.3
Missing	4	6	10	

Schools were asked to provide a space where students could sit in exam conditions, partly to ensure that the answers were the students' own and also to provide confidentiality for the students when answering the questions. Some schools were unable to provide this type of setting and even when they did, there were occasions where students conferred with their peers.

The research team

The research team and trainers attended all schools at baseline. The group was a mix of male/female with ages ranging from 25 to 60 years, including researchers, youth workers and ex-teachers. As this was a pilot study and the team was small, there was no variation in ethnicity as all were White. Moving forward to a definitive study where a large amount of field workers will be required to carry out the school visits, it will be possible to improve the age/gender and ethnicity balance.

Impact and learning

Impact and learning from this pilot study are centred on the future planning and delivery of a phase III cRCT to test effectiveness and cost effectiveness (see *Discussion/interpretation*). We are well placed to lead this work, having established a team of subject specific experts and methodologists with backgrounds in public health, sociology, health psychology as well as trial methods, statistics, qualitative methods and health economists. We have also strengthened our network of stakeholders and members of the public on gambling in young people.

Implications for decision-makers

It is too early to discuss implications for decision-makers due to this being a pilot study. However, this study has demonstrated that teachers, stakeholders (public health and policy officials) students and their family members all recognise the need to incorporate gambling and GRH within secondary schools. The successful findings from this pilot work (with all progression criteria confidently met) suggest that further resource for testing effectiveness and cost effectiveness is warranted.

Research recommendations

Findings from this pilot study suggest the following priority future research areas:

1. Longer-term cohort studies are needed to explore the impact of school-based gambling prevention programmes in adolescence.
2. Evidence review and consideration of gambling prevention programmes targeting a younger age group, for example primary school children. A possible extension to PRoGRAM-A could be using the cohort of trained peer supporters to deliver focused work to primary school children.
3. Greater exploration of the link between gambling and gambling-simulated games and the impact on the individual their community and society more generally.
4. Finally, from the perspective of complex health behaviour change intervention design and evaluation, we suggest that methodological guidance (e.g. an online toolkit) for researchers and practitioners is required to apply the social network intervention design used in this pilot study. This pilot study specifically used ego-centric networks as core intervention mechanism to help peer supporters identify people to initiate a conversation with. This approach could be applied to other risk-taking behaviour and interventions, with appropriate methodological guidance.

Conclusions

The PRoGRAM-A is an acceptable school-based, peer-led intervention to prevent gambling behaviour, which can be delivered with high fidelity. The trial methods were acceptable, with all settings recruited and retained. Some minor refinements in the intervention and trial methods would help to address increase students' perception of the real-word effects of gambling and follow-up data collection protocols prior to further testing in a larger trial. Progression to a larger RCT to test effectiveness and cost-effectiveness is warranted.

Additional information

CRediT contribution statement

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This synopsis should be referenced as follows:
Niven A, Miller M, White J, Noble L, Wardle H, Stoddart A, *et al.* Preventing Gambling Related Harm in Adolescents: PRoGRAM – A pilot cluster RCT – Synopsis Report. *Public Health Res* 2026;**14**(4). https://doi.org/10.3310/GJFD3715

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Acknowledgements

We would like to express our gratitude to all the young people, parents or carers, as well as the schools and teachers and other stakeholders who supported this study. Our sincere thanks also go to the young people's Patient and Public Involvement group and staff at Larkhall Universal Connections. We are deeply appreciative of the members of the Trial Steering Committee and the staff at the Edinburgh Clinical Trials Unit for their invaluable contributions. We would also like to thank FastForward for sharing their experience of delivering a gambling prevention programme in a youth setting. Lastly, we acknowledge The University of Edinburgh, the Lothian Health Board as cosponsors, and Adetiq Ltd for data processing.

Data-sharing statement

All data requests should be submitted to Dr Fiona Dobbie at fiona.dobbie@ed.ac.uk for consideration. Access to anonymised data may be granted following review.

Ethics statement

A favourable opinion from Edinburgh Medical School Research Ethics Committee (Ref-23 EMREC-016) was received on 9 August 2023. Local Authority approval was also obtained for all six schools taking part. Final approval was obtained from the head teacher at each school.

Information governance statement

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Disclosure of interests

Full disclosure of interests: Completed ICMJE forms for all authors, including all related interests, are available in the toolkit on the NIHR Journals Library report publication page at https://doi.org/10.3310/GJFD3715.

Primary conflicts of interest: Angela Niven, Leon Noble, Hannah Ensor, Freya Howell declared no conflicts.

Martine Miller, Andrew Stoddart, David Griffiths, Christopher Weir, Conor Maxwell, Richard Purves, Fiona Dobbie are grant co-applicants – NIHR funding.

James White is a grant co-applicant (NIHR funding) and has also received grant funding from Health & Care Research Wales, Chief Scientists Office Scottish Government, and Economic and Social Research Council.

Heather Wardle is a grant co-applicant (NIHR funding). She has also received grant funding from Wellcome Trust, Gambling Commission (including regulatory settlement funds), Economic and Social Research Council, Gambling Research Exchange Ontario, National Institute of Health Research, Blackburn with Darwen Local Authority, Office of Health Improvements and Disparities. She received consultancy fees from: Department of Culture Media and Sport, Greater Manchester Combined Local Authority, Greater London Authority, Institute of Public Health Ireland, National Institute for Economic and Social Research, McGill University, British Broadcasting Corporation, Lambeth Borough Council and Middlesbrough Borough Council. Heather Wardle has received support for attending meetings from European Gambling Regulators Forum and REITOX academy (administered by the Austrian National Public Health Institute). Heather Wardle is a member of the WHO panel on Gambling and runs a research consultancy for public and third-sector bodies. Heather Wardle does not and has not provided services to the gambling industry. Heather Wardle declares occasional attendance at events where gambling industry actors are present (including industry-sponsored conferences). As part of her work on the Gambling Survey for Great Britain, Heather Wardle is required by the Gambling Commission to participate in events disseminating research findings to their stakeholders, which includes the industry. Her attendance at events where industry is present is independently funded and does not involve collaborations or partnerships with industry.

In the last 5 years, Fiona Dobbie discloses grant funding for gambling-related projects from the Medical Research Council and the National Institute for Health and Social Research. Fiona Dobbie 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.

Department of Health and Social Care disclaimer

This publication presents independent research commissioned by the National Institute for Health and Care Research (NIHR). The views and opinions expressed by the interviewees in this publication are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, MRC, NIHR Coordinating Centre, the Public Health Research programme or the Department of Health and Social Care.

This synopsis was published based on current knowledge at the time and date of publication. NIHR is committed to being inclusive and will continually monitor best practice and guidance in relation to terminology and language to ensure that we remain relevant to our stakeholders.

Study registration

This study is registered as Research Registry – researchregistry8699.

Funding

This synopsis presents independent research funded by the National Institute for Health and Care Research (NIHR) Public Health Research programme as award number NIHR150838.

Award publications

This synopsis provided an overview of the research award *PRoGRAM-A (Preventing Gambling Related Harm in Adolescents): a pilot cluster randomised control trial to prevent gambling harm in young people*.

The following article is published as part of the thread:

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**:109. https://doi.org/10.1186/s40814-024-01537-w

For more information about this research, please view the award page (www.fundingawards.nihr.ac.uk/award/NIHR150838).

Additional outputs

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. *Addiction* 2025. https://doi.org/10.1111/add.70267

Miller M, Howell F, White J, Griffiths D, Noble L, Weir CJ, *et al.* Preventing gambling-related harm among adolescents (PRoGRAM-A): an embedded multi-modal process evaluation in a pilot cluster random control trial. *BMC Public Health* 2025;**25**:2327. https://doi.org/10.1186/s12889-025-23565-8

Griffiths D, Miller M, Niven A, White J, Noble L, Wardle H, *et al*. Mapping the diffusion of a school-based peer-led gambling-related harms intervention in Scotland. *Target J Youth Adolescence* 2025.

Griffiths D, Miller M, Niven A, White J, Noble L, Wardle H, *et al*. Assessing selection bias in a school-based social network intervention to prevent gambling-related harm. *Target J Prevention Science* 2025.

Conferences and webinar

Abstracts currently under review *n* = 2. A findings webinar was delivered on 27 March 2025. Findings have been presented at the following national and international conferences: Children and Young People Edinburgh Research (CYPER) Symposium (22 May 2025), Current Advances in Gambling Research (CAGR) Glasgow (16-17 June 2025); the Society for the Study of Addiction (SSA) Annual Conference, Newcastle (6–7 November 2025); the 5th International Multidisciplinary Symposium - Excessive Gambling: Promoting and Protecting Health in a Digitalised World, Montreux, Switzerland (18–20 June 2025) and the 8th European Public Health Conference, Helsinki, Finland (11–14 November 2025).

About this synopsis

The contractual start date for this research was in March 2023. This article began editorial review in April 2025 and was accepted for publication in July 2025. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The Public Health Research editors and publisher have tried to ensure the accuracy of the authors' article and would like to thank the reviewers for their constructive comments on the draft document. However, they do not accept liability for damages or losses arising from material published in this synopsis.

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Glossary

Alter Refers to any individual directly connected to the Ego in a social network map.

Ego Central individual in a social network. This is the person whose relationships are being studied.

Gambling-adjacent content/activities Activities or content that resembles or are similar to gambling but typically do not involve real money wagering.

Loot boxes Virtual items in video games that contain an unknown assortment of in-game rewards or cosmetic items such as skins (see below). These can be won with game play or purchased. Contents are hidden until they are opened.

Mop up Secondary visit made to schools to ensure that any individuals who were absent or unable to take part during the initial visit are given the opportunity to participate.

Peer led methods/interventions Educational approach where students teach each other.

Peer supporter A student selected by their classmates. They receive the Preventing Gambling Related Harm in Adolescents 2-day intervention training.

Skin betting Practice of using virtual items such as skins as a form of currency for gambling within video games.

Skins Cosmetic items in video games that alter the appearance of a character or weapon without affecting game play. They are visual modifications.

Social casino game Social casino games are online games that replicate traditional casino experiences, such as poker, slots and blackjack. Virtual currency is used instead and the focus is on social interaction.

Sociogram Visual way to 'map' an individual's social network.

List of abbreviations

ASN	additional support needs
ASSIST	A Stop Smoking in Schools Trial

ATGS-8	Attitudes to Gambling Scale (8 refers to 8 questions included in the scale)
CCA	cost–consequence analysis
CEA	cost-effectiveness analysis
CONSORT	Consolidated Standards of Reporting Trials
cRCT	cluster randomised control trial
CUA	cost–utility analysis
GRH	gambling-related harm
PA	Public Advisory
PHE	Public Health England
PHSE	Personal, Social, Health and Economic
PPI	patient and public involvement
PRoGRAM-A	Preventing Gambling Related Harm in Adolescents
QALY	quality-adjusted life-year
RCT	randomised control trial
SIMD	Scottish Index of Multiple Deprivation
SROI	Social Return on Investment
TIDiER	Template for Intervention Design and Replication
TSC	Trial Steering Committee
YPAG	young person's advisory group
YPGS	Young Persons Gambling Survey

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Appendix 1 Description of PRoGRAM-A intervention using Template for Intervention Design and Replication checklist

TIDier[64] item	Information on PRoGRAM-A intervention
Brief name	PRoGRAM-A intervention
Why	Gambling revenues, advertising and harms have increased in the past 20 years. In the UK, recent evidence has shown a high prevalence of gambling in young people compared to other addictive behaviours. Early intervention programmes exist for tobacco, alcohol and drugs; however, similar programmes for gambling are lacking. Peer gambling behaviour has been associated with gambling and GRHs. PRoGRAM-A is a school-based, peer-led informal intervention theoretically grounded in diffusion and network intervention theory. The intervention relies on identifying influential students who have credibility among their peers and who, once trained, will have the ability to promote gambling prevention messages and raise awareness of GRH in their social network/community
What materials	Peer supporters received 2 days of training, delivered out of school in a community venue. The training was implemented using the intervention delivery manual. Catering and venue costs were covered by the study. Pin badges and banner pens (with key messages to start a conversation) were provided for peer supporters. A website with key facts and information was also available to peer supporters
What procedures	Students completed a peer nomination questionnaire to nominate those within their year group they respected or looked up to. The students with the highest numbers of nominations were invited to be peer supporters. At the time of peer nomination, students were not aware that they were identifying influential others in a gambling-related context to prevent biased nomination. Peer supporters participated in 2 days of training which covered: (1) what is gambling; (2) gambling and gaming; (3) gambling advertising and marketing and (4) GRH and keeping safe. They learned how to have informal conversations and think about who they could have a conversation by mapping their social network using sociograms. After the initial training, trainers met with the peer supporters at three follow-up sessions over a period of 8–10 weeks to check their progress and to maintain engagement. Maps were also revisited at each follow-up and updated to record conversations with people in their social network
Who provides	Implementation of the intervention, including the 2-day training and the follow-up sessions, was provided by experienced youth workers. They were supported by the research team and school staff to arrange suitable times/accommodation for the training and follow-up sessions. Two members of teaching staff accompanied the peer supporters to the training venue – they were not involved in the training. They served as chaperones and were only called upon if pupil behaviour became challenging
How	Each school identified a main point of contact for the study. The research team liaised with the school and the trainers to identify and book a suitable training venue as close to the school as possible. The school identified staff to accompany the students to the venue and serve as chaperones for the 2 days. The research team liaised with the school (and trainers) to book class space and time for the peer supporters to attend the three follow-up sessions
Where	The 2-day training of peer supporters was conducted away from school premises in a community venue. Follow-up sessions with peer supporters took place in school during class time
When and how much	Peer supporter training was carried out over two school days with peer supporters. The three follow-up sessions took place in school during one school period of 40–50 minutes duration
Tailoring	Discussions took place at each school regarding students with ASN and how the intervention could be adapted to make sure all students could be included
How well (planned fidelity assessment)	A process evaluation provided an assessment for fidelity via: Recordings of semistructured interviews and focus groups with peer supporters and other S3 students Semistructured interviews with peer supporter's friends and family members Semistructured interviews with teaching staff, intervention trainers and stakeholders Observations of two entire delivery cycles of PRoGRAM-A in two separate schools, using semistructured observation log books

Appendix 2 Preventing Gambling Related Harm in Adolescents logic model

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