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Research Article

Optimisation of a sexual health and healthy relationships intervention for Further Education in England and Wales (SaFE)

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Abstract

Background: Adverse sexual health, dating and relationship violence, and sexual harassment are significant public health concerns, especially among young people. Sexually transmitted infection rates are at a 10-year high, and dating and relationship violence affects nearly half of young people. Further education provides a population-wide setting for delivering dating and relationship violence and sexual health interventions, but only a few interventions have been shown to be effective in further education.

Objectives: To optimise intervention materials and identify refinements for the Sexual Health and Healthy Relationships for further education (SaFE) intervention, an intervention to improve sexual health and reduce dating and relationship violence and sexual harassment among young people attending further education. Optimised materials were used in a pilot cluster randomised controlled trial of SaFE. SaFE had three components: (1) onsite access to sexual health and relationship services in further education settings provided by sexual health nurses for 2 hours, 2 days per week; (2) publicity about onsite services and (3) further education staff training on how to promote sexual health and recognise and respond to dating and relationship violence and sexual harassment. This paper reports on the optimisation of the SaFE intervention materials.

Design and methods: A multistage iterative process was used to optimise further education staff training and publicity materials. This involved a series of consultation and focus group feedback sessions.

Setting and participants: In Stage 1, feedback was collected from the SaFE Trial Management Group. Stage 2 involved: (1) two focus groups; one with four further education staff and one with three further education students at one further education institution and (2) stakeholder consultation with seven experts. Stage 3 saw consultation with the Trial Steering Committee who had independent oversight of the study. The operational feasibility of the training was evaluated in Stage 4 through a trial run with further education safeguarding and well-being teams. Stage 5 comprised a final review of intervention material by the Trial Management Group. Stage 6 gained online feedback from a young people's advisory group. The study was conducted in England and Wales.

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Results: In Stage 1, Trial Management Group reviewers recommended improving clarity and factual accuracy, reducing the length of slide decks and adding content on sending explicit images. Stage 2 feedback from further education staff and students focused on training content addressing comprehensiveness, structure and visual design and training delivery addressing preferred training formats and opportunities for scenario-based learning. The Trial Steering Committee in Stage 3 advised on managing participant disclosures and reordering content. Stage 4's trial run with further education staff identified redundancy in content, the incorporation of task-based exercises and varied learning approaches. Stage 5's Trial Management Group review led to the integration of multimedia elements and case studies. Stage 6 feedback from young people improved clarity and accessibility in publicity materials.
Limitations: Low participation and self-selection in focus groups may limit the generalisability of the findings. The move to online engagement during COVID-19 may have hindered the depth of interaction. Recruiting from a single institution could introduce sampling bias.
Conclusions: Fully optimised staff training and publicity materials were produced that were considered acceptable and consistent with the theory of change as agreed by the research team, Trial Steering Committee, stakeholder advisory group and further education students staff and young people.
Future work: After the optimisation phase, the SaFE intervention was delivered in a pilot cluster randomised controlled trial with high fidelity to six further education settings in England and Wales. Future work could explore strategies to evaluate the effectiveness as well as improve scalability and sustainability of interventions like SaFE.
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Background

Sexual health includes positive, pleasurable, respectful and safe sexual relationships and experiences free from coercion, discrimination and violence.[1,2] Young people aged 15–24 years in the UK are an at-risk group experiencing disproportionately high sexually transmitted infections (STIs) and dating and relationship violence (DRV).[3] STIs in England and Wales are currently at a 10-year high, with young people aged 15–24 years accounting for 65% of chlamydia cases, 21% of genital warts, 45% of genital herpes, 57% of gonorrhoea diagnoses and 7% of new human immunodeficiency virus diagnoses.[4,5] The UK also has one of the highest under-18 pregnancy and birth rates in Western Europe.[6] In 2021, 53.3% of conceptions in this age group lead to termination of pregnancy.[7]

The physical, emotional and sexual abuse carried out in a relationship is known as DRV.[8,9] In England and Wales, 55.1% of boys and 53.5% of girls aged 16–19 years attending further education (FE) settings report experience of DRV.[10,11] There is an increased risk of depression, substance misuse, antisocial behaviour and suicide attempts among younger people who have experienced DRV.[12,13] Women, between the ages of 15–19 years, who have experienced DRV have a higher rate of mortality.[14]

Multiple systematic reviews recommend school-based interventions that enhance skills like conflict management, shift peer norms against DRV and involve young people in service design.[15–17]

We conducted a systematic review of evaluations of interventions to improve sexual health, including contraceptive use, unplanned pregnancies, STI testing, DRV and sexual harassment in FE settings. Of the 2113 potentially relevant studies identified, we included four on the basis of full-text review.[18] In our review, none of the studies included reported a reduction of unprotected sex or assessed DRV. Internationally, we could not find any interventions to both promote sexual health and prevent DRV in FE settings. We could not find any other relevant studies currently being undertaken.

In response, we developed the Sexual Health and Healthy Relationships for Further Education (SaFE) intervention to prevent DRV, sexual harassment and promote sexual health in FE settings.[10] The intervention development study involved over 2000 students and 200 staff across 6 FE settings in England and Wales and resulted in three candidate components that were acceptable to FE students, FE staff and stakeholders: (1) onsite access to sexual health and relationship services (providing condoms, STI and pregnancy tests as well as relationship advice, support and guidance) provided by sexual health nurses available for 2 hours on 2 days per week; (2) publicity about these services and (3) FE staff training on how to promote sexual health and recognise, prevent and respond to DRV and sexual harassment.[10] The detail of the intervention is described in the adapted version of the Template for Intervention Description and Replication[19] checklist in *Report Supplementary Material 1*.

Here, we report on work to optimise and then assess the feasibility and acceptability of the SaFE intervention.[20] We used materials previously used by local authority public health staff to promote sexual health and prevent DRV and sexual harassment in schools and developed draft staff training and publicity materials for use in FE.[10,19] We then convened a network of stakeholders and engaged in a multistage process of stakeholder engagement, delivery, data collection and refinement to optimise intervention materials for use in FE settings. The optimised SaFE intervention was then evaluated in a pilot cluster randomised controlled trial (cRCT) in eight FE settings across England and Wales. Details of the pilot cRCT are presented elsewhere.[20]

Aims

To optimise existing materials and identify required refinements for SaFE, an intervention to improve sexual health and reduce DRV and sexual harassment among young people in FE settings.

Methods

Theoretical basis

Public health interventions often show reduced effectiveness in real-world settings due to varying participant characteristics, resources and implementation quality.[21] In part, this is due to problems with implementation. Strategies to improve implementation, such as staff training, aim to improve fidelity to the intervention programme theory. However, reviews indicate that these strategies lead to only minor enhancements in implementation.[22,23] Inspired by fields such as engineering, the concept of optimisation through ongoing, purposeful adaptations has been proposed to incrementally improve intervention effectiveness.[24,25] Optimisation plays a crucial role in ensuring that interventions remain adaptable to real-world challenges, addressing variations in implementation, participant needs and resource availability.[22,23] By continuously refining components based on empirical feedback, public health interventions can achieve sustained effectiveness and improved scalability.[24,25] Optimisation also aligns with continuous quality improvement in health care.[24] Recent studies have used multistage optimisation to refine intervention components for smoking cessation[26] and sexual health and illicit drug prevention with young people.[27–29] The theory of change for the SaFE intervention[30] suggests that the implementation of the intervention activities (publicity of onsite sexual health/relationship services, staff training and signposting of educational resources) at each FE setting may lead to decreased unprotected sex and DRV. These can also lead to a decrease in incidence of STIs, unplanned conceptions, harassment and non-volitional sex. This is due to individuals' increased knowledge, awareness and access to services as well as empowerment, confidence and self-efficacy at an individual level.[30]

Study design

The study included the following multiple methods: a desktop review and consultation with the Trial Management Group (TMG) (Stage 1), refining initial intervention materials. Focus groups with FE staff and students, alongside stakeholder input, helped shape content further (Stage 2). The Trial Steering Committee (TSC) provided independent oversight of the materials (and later pilot trial) (Stage 3), followed by a trial run with FE staff to test feasibility (Stage 4). Final revisions were made through the TMG (Stage 5) and advice leading to public health advancement (ALPHA) feedback (Stage 6), leading to the first training session for implementation. *Table 1* summarises the activities, number of people and job roles, and method of engagement used to optimise staff training and publicity materials for FE settings.

Recruitment and sampling

The sampling methodology was designed to ensure relevant expertise and diverse perspectives informed the optimisation process. Stage 1 involved 13 academic experts from the TMG. For the Stage 2 focus groups, we used purposive sampling to gather insights from those directly engaged with FE, seven participants: four members of FE staff and three FE students aged ≥ 16 years. Staff were recruited through an FE institution, who were approached to take part in the main study but already offered onsite sexual health provision. This made them ineligible for the trial but still able to take part in the optimisation proces. Students were recruited through the same FE institution's well-being team on our behalf. Study information and consent forms were provided, and informed consent was obtained from all participants. Intervention materials were shared with participants and feedback and proposed changes were discussed. The FE institution arranged the date and time with the participants, and together with the research team, participated in an online meeting (due to COVID restrictions). For the Stage 2 consultation with stakeholders, we invited 12 stakeholders from a variety of relevant disciplines, which allowed a broad range of sector-specific insights. In Stage 3, the TSC reviewed the intervention materials, and ensured independent oversight. In Stage 4, we undertook a trial run of the delivery of the staff training with the same FE staff group from Stage 2. These were members of the FE setting's safeguarding and well-being teams. Stage 5 involved re-engaging with the TMG for a final review of the intervention materials. In

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TABLE 1 Summary of multistage optimisation

Stage	Activity	Date	No. of people	Place	Job roles
Stage 1	Desktop review, consultation with Trial Management Group	28 May 2021	13	Online: e-mail feedback	Experts in sexual and public health, sociology, intervention development and interventions in complex systems, quantitative and qualitative evaluation methods, statistics, trials methodology and health economics
Stage 2	(1) Two focus groups; one FE staff; one FE student (2) Consultation with stakeholders	23 June 2021	FE staff = 4 FE students = 3 stakeholder representatives = 7	Online: Microsoft Teams® (Microsoft Corporation, Redmond, WA, USA)	FE staff Safeguarding co-ordinator, development officer, engagement manager, well-being officer Stakeholder advisory group Representatives, including those from Local Authority public health teams in England and Wales, Public Health Wales, LGBTQ+ and other young people's charities
Stage 3	Consultation with TSC	6 July 2021	7	Online: e-mail feedback	Seven delegates, including academics, FE teachers and third-sector representatives
Stage 4	Trial run with FE staff	3 September 2021	7	Online: Microsoft Teams	FE staff Safeguarding co-ordinator, development officer, engagement manager, well-being officer
Stage 5	Final review by Trial Management Group	4 November 2021	13	Online: e-mail feedback	Experts in sexual and public health, sociology, intervention development and interventions in complex systems, quantitative and qualitative evaluation methods, statistics, trials methodology and health economics
Stage 6	ALPHA feedback on poster	17 November 2021	4	Online: e-mail feedback	ALPHA youth group; young people who advise researchers on public health topics and research. ALPHA is open to anyone aged 14–25 years in Wales
First training		22 November 2021	20	Online: Microsoft Teams	Heads of year, head of safeguarding, deputy head of safeguarding, well-being officers

MS, Microsoft; LGBTQ+, lesbian, gay, bisexual, transgender, questioning/queer +.

Stage 6, the ALPHA youth patient and public involvement (PPI) group provided feedback on the student-facing publicity materials. The recruitment information emphasised psychological safety by advising participants not to share personal experiences to prevent distress and potential trigger responses. Instead, they were signposted to support resources to ensure their well-being throughout the study, given the potentially sensitive nature of the subject matter.

Equality, diversity and inclusion

Dating and relationship violence, sexual harassment and GBV are rarely considered as joint constructs despite longitudinal evidence demonstrating that experience of DRV predicts young people's later GBV victimisation and that they share common risk factors.[13] They are public health issues, with inequality generating long-term impacts on health. While boys and girls both experience major burdens of emotional and physical DRV, the impacts are disproportionately reported by girls. While it is well understood that sexual and gender minority adolescents experience higher levels of GBV in terms of homophobic and transphobic bullying and sexual harassment,[31,32] girls also experience higher rates of physical and sexual DRV.[33] Importantly, a key source of these inequalities is the shared impact of educational contexts, including prevalence and response to DRV and GBV, both of which point to the importance of education-based interventions.[34] In order to ensure the study was inclusive, and that we were able to explore differential experience by diverse sociodemographic groups, questions were included on the pilot study survey relating to gender and sexual identities to assess if the diversity seen in study participants was representative of the wider population of young people. Those involved in the qualitative focus groups were purposively recruited to represent diverse gender and sexual identities.

Data collection

Table 1 summarises the timelines and method of data collection. For Stages 1, 3, 5 and 6, the intervention materials were shared via e-mail and discussion responses were collated. Stages 2 and 4 were conducted through Microsoft Teams® (Microsoft Corporation, Redmond, WA, USA). For Stage 2, flexible topic guides were developed by RW-T and HY and were reviewed by the TMG, which mapped onto the aims of the project. Each focus group lasted 90 minutes, with the stakeholder advisory group lasting 60 minutes. Notes were made during all sessions by RW-T. An online digital sharing platform (Padlet - Visual Collaboration for Creative Work and Education, https://padlet.com) was circulated before the focus groups for participants to anonymously share their thoughts before, during or after the session.

Data analysis

For Stage 2, focus group data were transcribed verbatim. Participants' identities were anonymised in the transcripts using their role in FE (staff or student) and sequential numbers (1, 2 and 3). The principles of thematic analysis were used to analyse focus group data.[35] Transcripts were coded by RWA using a combination of inductive and deductive codes, with the framework being iteratively refined as coding progressed. Codes were mapped onto the topic guide and discussed with the research team. Codes were compared and contrasted between FE students and staff to generate themes on the content and delivery of the intervention materials. Themes were then explored across two groups (students and staff) to identify commonalities and divergences in perspectives. Data management of codes and analysis were supported by Microsoft Excel® (Microsoft Corporation, Redmond, WA, USA). The language and terminology reported in the results reflect that used by participants. The terms 'learner' and 'student' are used interchangeably.

Service user involvement

This study builds on 15 months of previously published work with over 2000 students and 200 staff from 6 FE settings, 12 sexual health staff and the young people's PPI advisory group ALPHA, to explore which components should be combined into an intervention.[10] The current research was developed, conducted and delivered with service user involvement as well as FE staff and students. The ALPHA PPI young people's group also reviewed the final intervention materials.

Ethics

Ethical approval was obtained from Cardiff University School of Social Sciences Research Ethics Committee (Reference: SREC/3397) and NHS Ethics (Reference: 20/WA/0090). Focus group participants were provided with an information sheet detailing the nature of the study as well as their rights as participants relating to confidentiality, anonymity and withdrawal, and they gave informed consent before taking part. Online discussions were recorded, with audio being professionally transcribed. Data were securely stored on Cardiff University's secure network, with all interviews anonymised during transcription.

Results

Table 2 summarises the feedback and changes made for each stage and intervention component.

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TABLE 2 Summary of the findings and changes made in each stage

Activity	Intervention component	Summary of suggestions + changes made
Stage 1 Desktop review, consultation with Trial Management Group	FE staff training on how to promote sexual health and recognise, prevent and respond to DRV and sexual harassment	• Ensure intervention materials are clear and backed by referenced facts (e.g. prevalence of STIs/unprotected sex) • Emphasise practical, user-focused training • Ensure training challenges staffs' pre-existing knowledge and assumptions about learner behaviour, especially regarding women and multiple partners • Improve signposting for relevant school/college policies and referral options • Shift focus from Gillick competence[36] to broader risk behaviours, including violence and coercion • Prioritise sexual harassment by removing outdated references and adding interactive case studies • Add sections on image-sharing/sexting, digital abuse, cultural obstacles and sexual harassment and pornography *Changes made:* • Two decks of 59 and 36 slides were consolidated into 93 slides, streamlined, typographical errors corrected, section breaks removed • Adding content on image-sharing/sexting and expanding content on digital abuse and cultural obstacles. New section title for sexual harassment and pornography
	Publicity of onsite sexual health and relationship services	Posters had typographical errors *Changes made:* Typographical errors corrected
Stage 2 (1) Focus group FE staff; (2) consultation with stakeholders	FE staff training on how to promote sexual health and recognise, prevent and respond to DRV and sexual harassment	1. Content (a) Comprehensiveness and structure • Cover essential topics such as risky sexual behaviour, consent, recognising unhealthy relationships, pornography and harassment, with attention to nuances of age, legal implications and personal readiness • Emphasise legal boundaries related to consent, particularly image-sharing laws and risks of coercion, ensuring learners understand legal and personal dimensions • Educate staff on safeguarding principles, including recognising exploitation and abuse. Include detailed reporting procedures and encourage educators to guide students on when and where to seek help • Ensure staff training covers how to approach sensitive topics with non-native English speakers and students with special needs, fostering an inclusive approach for diverse backgrounds and abilities (b) Visual design • Design visually appealing materials, using bright colours and impactful messaging. Posters should emphasise accessibility, privacy (non-college staff) and free services • Utilise digital screens, QR codes and push notifications on familiar platforms (e.g. Microsoft Teams) to make resources accessible • Provide clear pathways to external support, websites and services, empowering students to access information outside FE 2. Delivery theme (a) Preferred training formats • Use activities such as case studies, group discussions and practical examples to foster engagement • Ensure a mix of theoretical knowledge and real-world scenarios to keep training relevant, particularly for sensitive topics like consent and peer pressure • Recognise time limitations by designing concise yet effective half-day sessions that maximise engagement and cover essential points

TABLE 2 Summary of the findings and changes made in each stage (*continued*)

Activity	Intervention component	Summary of suggestions + changes made
		(b) Opportunities for practical application and skill-building • Use realistic examples and case studies to help relate to students' experiences, such as online exploitation and consent • Train staff to be non-judgemental and mindful of their biases when discussing sensitive topics, creating a supportive environment for students • Emphasise understanding students' social realities, allowing educators to better respond to learners' needs with empathy and situational awareness • Guide staff on using sensitive, positive terminology to avoid stigmatisation, fostering a safe and supportive learning environment for all *Changes made:* • Reduced number of slides from 93 to 66; reducing participant introductions, risky sexual behaviour and various consent and DRV topics. Content moved to supplementary materials • Reducing text-heavy content • Simplified content on DRV and coercive control and removed slides on gaslighting • Adjusted training to 2 hours • Supplementary materials expanded to include extra content on risky sexual behaviour, details on Fraser guidelines[37] and support services Stakeholder feedback • Revise title 'Risky Sexual Behaviour' to avoid negative connotations and make it more inclusive • Use sensitive language, recognising early sexual activity occurs due to abuse and other uncontrollable factors • Incorporate diverse perspectives on topics like 'multiple sexual partners', 'sexual health' and 'sexuality', allowing room for personal experiences. Trainers should be prepared to handle sensitive issues • Allow trainers flexibility to focus on three key topics per session for more detailed discussions within the limited time • Include diverse imagery, representing different ethnicities and relationships, and address content related to religion and LGBTQ+ experiences • Provide additional context for the video explaining consent using a 'cup of tea' analogy (the 'Consent and Tea' video), especially for younger audiences, and introduce consent and legality earlier • Include a 'localised signposting' slide at the end of each section to guide individuals to support services • Clarify staff roles and responsibilities and provide clear guidelines for handling disclosures, especially in cases of abuse • Emphasise confidentiality, but explain duty of care and the importance of safeguarding, with specific red flags to recognise • Address abuse more inclusively, acknowledging the experiences of men and LGBTQ+ individuals. Mention issues like fetishisation of people from Black, Asian and minority ethnic groups and LGBTQ+ people • Summarise key responsibilities at the end of the session and provide contact details for local services and follow-up support • Produce bilingual posters in Wales and include the local, relevant service logos • Add a 'rainbow' logo to show LGBTQ+ support and inclusivity • Add a helpline number for alternative service access • Share support service details widely through social media, college screens, Microsoft Teams and newsletters • Evaluate sexual health training and consider further training focused on resource signposting

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TABLE 2 Summary of the findings and changes made in each stage (*continued*)

Activity	Intervention component	Summary of suggestions + changes made
		Changes made: • Title 'Risky Sexual Behaviour' was revised in question form for discussion relating to what constitutes risky sexual behaviour • Sensitive language was used to acknowledge the impact of abuse on early sexual activity • Trainers given flexibility to focus on three key topics per session for in-depth discussion • Diverse imagery included, reflecting various ethnicities, relationships and addressing LGBTQ+ issues • 'Consent and Tea' video was contextualised for younger audiences, with consent and legality introduced earlier • Localised signposting slides were added to direct individuals to support services • Staff roles and responsibilities clarified, emphasising confidentiality, safeguarding and handling disclosures • Posters updated bilingually in Wales with relevant logos • Added LGBTQ+ 'rainbow' logo and privacy concerns addressed • Included helpline number for alternative access
	Publicity of onsite sexual health and relationship services	• Use bright, eye-catching posters to highlight free and external nature of the service • Use digital images on announcement screens and online platforms, along with QR codes; colleges often prefer screens over posters • Incorporate push notifications via college apps and specify that the service is for over 16-year-olds *Changes made:* • Developed bright, eye-catching posters to show that the service is free and run by external staff while utilising digital images and QR codes on announcement screens and Microsoft Teams • Incorporated push notifications via the college app to specify that the service is for over 16-year-olds
Stage 3 Consultation with TSC	FE staff training on how to promote sexual health and recognise, prevent and respond to DRV and sexual harassment	• Intervention materials were informative • The TSC emphasised the need for trainers to be able to manage participant disclosures like sexual harassment *Changes made:* • The slide title was changed, and an introduction was added before covering risky sexual behaviour. Content order was adjusted to address sex and sexualisation before risky sexual behaviour • Signposting content was moved to supplementary materials and was included as slides at the end, with a reminder to check local policies and procedures
Stage 4 Trial run with FE staff	FE staff training on how to promote sexual health and recognise, prevent and respond to DRV and sexual harassment	• Training disrupted by staff perception of unaddressed previous feedback • Streamline content to eliminate repetition • Accommodate different learning styles by adding visual material, using online platforms for engagement, incorporating task-based exercises, leveraging trainer experience and including case studies • Some participants found training redundant due to prior experience in pastoral care and safeguarding *Changes made:* • All definitions were added to supplementary materials • Revised training includes more visual material, online engagement, task-based exercises, trainer experience and case studies to accommodate diverse learning styles

TABLE 2 Summary of the findings and changes made in each stage (*continued*)

Activity	Intervention component	Summary of suggestions + changes made
Stage 5 Final review by Trial Management Group	FE staff training on how to promote sexual health and recognise, prevent and respond to DRV and sexual harassment	• Merge slides and combine aims to highlight trainer's experience with case studies at the beginning of each section • Add engaging multimedia content, including consent animations and fact/myth videos, along with relevant case studies • Move signposting and support sections to supplementary materials and include slides on onsite sexual health services *Changes made:* • Intervention materials made more cohesive and structured by adding more visual content, changing wording (pornography to pornographic content) and starting each section with a case study, or lived experience from the trainer • Included detailed information on onsite sexual health services
Stage 6 ALPHA young people's PPI stakeholder group feedback	Publicity of onsite sexual health and relationship services	• Posters were bold and concise but needed contact details and consistent formatting • Some messages (e.g. pornography and abusive relationships) required clearer communication and additional context • Varying colours and using more relevant imagery would enhance message distinction and audience engagement • Key terms should be emphasised and calls to action should be more direct to improve accessibility *Changes made:* • Contact details added, and formatting was standardised for clearer communication • Messaging on sensitive topics was clarified • Colours, imagery and key terms were adjusted to improve message distinction, engagement and accessibility

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Stage 1

We conducted a desktop review to examine existing, publicly available staff training materials on sexual health promotion and DRV prevention (e.g. through third-sector organisations) or used by a local authority public health team. These initial intervention materials consisted of a slide deck for staff training with supplementary information. The posters to advertise the onsite services were developed by the trial team, using key information (timings, location and services offered) as a basis with the title 'sexual health drop-in service'. We shared these materials with the TMG who provided detailed feedback.

On the format of staff training, it was suggested to decrease the theoretical content and to increase the use of case studies and scenarios, including discussions on managing coercive control and domestic violence, prompting participants with reflective questions like 'What would you do?' and 'How would that make you feel?'. It was also suggested to incorporate personal stories whenever possible, such as those on www.everyonesinvited.uk/. It was also suggested to assess the comfort levels of FE staff members before any student intervention, provide clear information on whom to consult for further advice and for staff to familiarise themselves with their setting's current polices. A separate document of frequently asked questions (FAQs) or supplementary information was suggested for FE staff to refer to should they want more information. The focus on sexual harassment was to be increased in all discussions, with prevalence figures to underscore its significance. To improve the overall presentation, a consistent logo and background was recommended. Additional content was suggested to address image-sharing and sexting and include a title slide for the Sexual Harassment and Pornography section. Finally, it was suggested to eliminate the lunch break for better time management. These concerns were addressed in the staff training slide deck. The two slide decks of 59 and 36 slides were consolidated into 93 slides.

Feedback on publicity posters focused primarily on sexual harassment content, ensuring that all facts were properly referenced and presented in memorable bite-sized pieces. Additionally, prevalence estimates for domestic violence, harassment and revenge porn needed to be included to highlight their significance.

Stage 2

Focus groups

The analysis identified two central themes regarding FE staff training: content and delivery. The content theme focused on (1a) comprehensiveness and structure and (1b) visual design. The delivery theme addressed (2a) preferred training formats and (2b) opportunities for practical application and skill-building. Quotes are included below as illustrative examples of analytical themes.

Theme 1a: content: comprehensiveness and structure

Participants felt that the FE staff training content covered essential topics adequately while allowing room for discussion on more niche subjects.

> *I think it covers adequately the main points that tutors should be aware of. It can get open to a lot of discussion points as well.*
>
> *Student 2*

Student and staff participants emphasised the need to differentiate between younger and older students and the importance of clarifying the legal nuances of consent, particularly around image-sharing laws. Participants were concerned that students may be legally old enough for sexual activity but unaware that sharing explicit images under the age of 18 years is illegal in the UK.

> *With the definition, what the law defines concern, I do think you need to put in about images because learners do not get that they are old enough to have sex, but they're not old enough to take photos of themselves.*
>
> *Staff 2*

Participants suggested that training needed to clearly define consent, especially about age and personal readiness, alongside legal definitions. They felt that any discussions FE staff had must encompass the nuances of personal readiness and the implications of coercion.

> *You might wanna rephrase it as, like, I don't know, sex before they're ready. And then that'll either be due to personal preference or due to personal, like, cultural reasons. I don't really care what age learners are having sex. Bearing in mind, you know, most of them are over the age of 13, so safe guidelines and stuff is fine. It just bothers me about whether they're safe and happy and it's their choice kind of thing.*
>
> *Staff 2*

Participants mentioned the importance of discussing relationships, especially first experiences, when working with students. Participants reported that FE staff should be aware of the challenges young people face in their relationships and provide guidance on navigating these situations.

> *Sometimes when maybe, someone is in a first relationship and he's not really comfortable … it could be useful for them to [discuss this].*
>
> *Student 1*

Participants felt it was important that staff training covered how to ensure educational content was accessible and understandable for students from diverse linguistic backgrounds and additional needs. They highlighted the need for FE staff to provide resources for non-native English-speaking students and consider the unique needs of students with disabilities.

> *Someone with a different background and English is not his first language, so maybe … they can have difficulty to explain their situation. I was wondering about learners with special needs, of course, sexuality is for them as well.*
>
> *Student 1*

Participants raised the need for FE staff to be able to explicitly communicate the consequences of inappropriate behaviours and the process for reporting. They felt it would be beneficial for staff to be able to guide students in recognising unlawful behaviours and the reporting procedures, including where to seek help, such as through Victim Support. Providing clear pathways for reporting misconduct was considered to be an essential component of the training.

> *Whenever you're using like case studies … always refer to reporting and recording.*
>
> *Staff 1*

Safeguarding was seen by participants as a critical thread throughout, with an emphasis on recognising signs of abuse, appropriate responses and the role of tutors in supporting affected students.

> *I would put safeguarding in the beginning and then just weave it all the way through.*
>
> *Staff 2*

Theme 1b: content: visual design

To promote a new onsite sexual health service, we developed a mix of physical and digital marketing. Participants wanted posters to use bright colours, emphasise the free nature of the service and clarify that it is run by non-college staff (which was intended to encourage students seeking privacy). However, there were reports of resistance to physical posters from campus facilities, so digital screens and QR codes were also recommended. FE staff planned to leverage direct channels familiar to students, like push notifications through college apps and posts on Microsoft Teams, making information easily accessible in students' daily routines. FE staff felt that colleagues should provide students with signposting to external resources, including websites and support services, to enhance their guidance and safeguard students' well-being.

> *So, with the resources then I guess you could like signpost to various websites that offer advice and guidance.*
>
> *Staff 1*

Staff were asked to review intervention training, posters and social media content, assessing overall impact, visual appeal and adequacy of information. Participants felt that the separate document of FAQs and supplementary materials needed to include facilitator notes and signposting information to local- and FE-based sexual health and relationship services as well as scenarios and processes to follow relating to safeguarding.

Staff proposed integrating messages into the college environment through posters and other visible reminders. They felt that this would create a culture of consent and safety, thereby normalising discussions around these issues and encouraging them to seek support. Participants felt that posters were crucial. One staff member also believed that the use of shocking statistics or relatable messaging could motivate young people to engage with sexual health services.

> *At the bottom (add), do you know that one in eight young people have Chlamydia? Just to scare them into coming and getting condoms from us.*
>
> *Staff 1*

Theme 2a: delivery: preferred training format

Participants agreed that engagement methods, such as interactive activities and case studies, were vital for maintaining FE staff interest and ensuring a better understanding of the challenges that students face. Participants emphasised the importance of a well-structured training program, with a balance between theoretical knowledge and practical examples.

> *I think the slides are really again really dry and I think they would need some more examples because they might not even see the difference.*
>
> *Staff 3*

Incorporating real-world scenarios and case studies was deemed essential for helping FE staff relate training to their own experiences. This approach was believed to aid understanding concepts like consent and peer pressure, especially in relation to the video explaining consent using a 'cup of tea' analogy (the 'Consent and Tea' video) to which participants had mixed feelings. Participants emphasised the importance of using real-world examples and scenarios to enhance staff's ability to respond effectively to students' needs.

> *The video does, you know, in a very brief sense to demonstrate what context of consent is, but it's not realistic to the actual situations that students are dealing with. You know what I mean? So, they, they could deal with consent in terms of peer pressure. Simple, but then it also could be with the fact where they don't actually understand consent themselves, and they might be acting against it. So, it's real situations I think need to be included.*
>
> *Staff 3*

Various modes of delivery, including roleplay and scenarios, were discussed by participants as methods to engage FE staff.

> *Not just sitting, looking at, at a PowerPoint. You know you're taking part because you do tend to switch off, whereas if you have to think and, you know, by doing that talking in a group?*
>
> *Staff 4*

Some staff were hesitant about roleplay.

> *Nobody likes role plays, and I think a role play about sex might be a step too far. Send them over the edge. They just walk out.*
>
> *Staff 3*

The time allocated for staff training was limited, which was considered to hinder both the depth and breadth of content. However, staff felt it was essential to find efficient ways to deliver training within the available time.

> *You're not gonna have a lot of tutors' time to deliver it … half a day is more achievable than a full day.*
>
> *Staff 2*

Participants suggested incorporating technology for engagement through digital messages and publicity for the onsite sexual health and relationship services (e.g. QR codes and interactive screens).

> *QR codes as well. They seem to be the, the buzzword, don't they? If you can have a QR code and they, they scan it and it links to the information, so they've got it on their, their laptop or phone or whatever seems to be quite popular these days.*
>
> *Staff 4*

Theme 2b: delivery – practical application and skill-building

Besides relatable and engaging, real-life content, participants suggested that FE staff need to be updated on the current social dynamics and experiences of young people. This would enable them to relate to students and provide relevant information that reflects their realities.

> *… tutors won't really be interested in learning about this. They'll be interested in learning about the sort of like direct experiences, … their learners are experiencing, and how to respond to it rather than learning about, you know, the definitions of it, if that makes sense.*
>
> *Staff 6*

Participants reported that the training needed to prompt FE staff to recognise their potential biases and the judgements that can arise in discussions about sexual health. They thought that it was crucial for FE staff to be able to foster an open and non-judgemental environment to encourage honest discussions with their students.

Participants reported that there were a range of attitudes and willingness to engage with sexual health topics among FE staff. Participants felt that training should accommodate these differences to ensure that all FE staff are prepared to communicate with their students effectively. Participants felt that FE staff should be aware of the impact of terminology on students' perceptions and feelings about their experiences.

> *You will have some tutors who know what young people get up to and you'll have other tutors who don't and might be a bit judgy.*
>
> *Staff 6*

> *It's down to personal experience, but survivor will always have a positive meaning behind it in a way. But victim doesn't necessarily have such a positive outcome from the words. So, if you were to choose between, it would probably be better. You survive. But then again, just having victim on its own, it's very neat and it's, it doesn't build such a positive image.*
>
> *Student 1*

Stakeholder feedback

Stakeholders suggested revision of title 'Risky Sexual Behaviour' to avoid pejorative connotations that could create barriers to engagement. Sensitive language was recommended, especially considering early sexual activity may result from abuse, which can influence behaviours beyond an individual's control. Care also needed to be taken when addressing topics such as 'multiple sexual partners', 'sexual health' and 'sexuality', ensuring that varied perspectives were considered. Stakeholders thought trainers needed skills to handle emotive topics and attendees may need additional support. Trainers should have flexibility selecting topics based on group needs. Given the one-off training format, prioritising critical topics was considered to be essential; focusing on three topics per session was suggested. The slide deck needed to include diverse images, representing varied ethnic backgrounds and relationships, rather than focusing solely on straight, White relationships.

The 'Consent and Tea' video needed additional context for young audiences to avoid oversimplification. This could involve discussions on online behaviours like sending images, particularly considering the legal implications for under-18s. Consent and legality should appear earlier in the session. A 'localised signposting' slide was recommended at the end of each section to direct individuals towards resources. Clear guidance on what support staff can offer, along with specific next steps for abuse victims, was deemed crucial, as was introducing a 'staff expectations' slide to clarify procedures for handling disclosures. Confidentiality needed to be emphasised, although trainers needed to clarify their duty of care if safety concerns arose.

The topic of abuse needed to be addressed broadly to avoid gender bias, acknowledging high statistics of abuse among men and LGBTQ+ individuals. There was a specific mention of covering fetishising ethnic minority and LGBTQ+ individuals to support a holistic view of harassment. The concluding slides were suggested to summarise responsibilities for staff, signpost local services and provide trainer contact information. Participants highlighted follow-up support options to ensure that participants felt supported after the training.

Posters were recommended to feature the logo of the city as well as other relevant service providers to ensure local relevance. It was also advised to incorporate a 'rainbow' logo, symbolising support for LGBTQ+ people and fostering diversity. Welsh posters needed to be produced bilingually. Concerns were also raised regarding the confidentiality of the services, particularly around the visibility of individuals entering session rooms.

Participants recommended a helpline number be added to offer an alternative method for individuals to access support, including on social media, TV screens around the college site, Microsoft Teams and newsletters, to maximise reach.

Stage 3

The training slides were shared with the TSC who felt they were informative and well-crafted. The TSC suggested reordering content to discuss sex and sexualisation prior to risky sexual behaviour, and the signposting information was proposed to be moved to supplementary materials, with an emphasis on encouraging participants to check local policies. It was also suggested that staff be prepared to handle disclosures from FE students.

Stage 4

This stage involved a trial run of the delivery of the training with FE staff. Feedback included the two slide decks be combined to streamline presentation and eliminate repetition. For online training, the use of more interactive tools was recommended to engage participants, such as prompting them to type responses. Participants expressed a preference for the trainers' real-life experiences, suggesting the inclusion of more scenario-based exercises. It was also advised to increase the use of visual materials to accommodate different learning styles. The material was generally received positively, apart from one member of staff.

> *There's been one occasion, actually, where I have, yeah, I have had to have, um, what would have been an uncomfortable conversation before perhaps, but, um, it, it didn't feel so uncomfortable. Um, after I'd had the training, I knew the things I needed to say then.*
>
> *FE staff 2*

Some participants felt they did not require domestic violence and safeguarding training due to their prior experience and training. Incorporating role play and group tasks was suggested by some staff. It was recommended that slides with similar content be amalgamated and definitions moved to supplementary materials.

Stage 5

A final review by the TMG suggested that the housekeeping and welcome slides be merged to streamline the introduction, and the aims and objectives for each topic were combined for greater coherence. A

consent animation video was introduced to enhance participant engagement. The revised materials began each section with a case study or the trainer's lived experience. Detailed information on onsite sexual health services was also included.

Stage 6

Feedback from the ALPHA young people's group indicated that the posters were regarded as bold, concise and effective in conveying the message, although it was recommended that contact details be included to facilitate further action. Some posters, such as those addressing pornography and abusive relationships, required clearer messaging. For instance, the abusive relationships poster could have been enhanced by including brief explanatory text to engage those who may not recognise subtle signs of unhealthy relationships. Concerns were raised regarding the visual elements, particularly the excessive use of the purple and yellow colour scheme, which could have made the messages appear too similar and visually overwhelming. Introducing varied colours and graphics was recommended to differentiate the messages and sustain audience engagement. Additionally, the use of medical imagery on the relationship posters seemed misaligned with the topic, and more relevant visuals, such as hearts or text bubbles, were considered to be more appropriate. Highlighting key terms such as 'privately' and 'confidentially' when referring to the advertised onsite services was suggested to reinforce trust and security. The posters and videos needed to more clearly state onsite services were run by qualified professionals.

Discussion

Main findings

A multistage optimisation process was used to refine the intervention materials for use in the SaFE intervention. We optimised FE staff training materials and publicity materials to advertise the onsite sexual health services. Together with two experts in sexual health and domestic violence training and delivery, we identified the need for clear, accurate guidance, addressing issues such as sexting and sexual harassment. FE staff, students and stakeholders recommended changes to the delivery methods and content, including addressing sensitive topics using personal experiences and scenarios. The TSC validated content value and highlighted the need for FE staff who receive training to manage sensitive disclosures from FE students. Feedback from young people led to revisions in publicity materials, adding onsite service contact details and improving accessibility through colour and imagery adjustments.

Comparison to existing literature

While strategies like training sessions aim to enhance fidelity, they typically yield only marginal improvements, leading to underperformance in the field.[38] To address these challenges, optimisation through ongoing adaptations driven by stakeholder feedback is proposed as a method for refining interventions, particularly when enhancing sexual health services.[24,25,28] There is currently no guidance on approaches to optimising or refining intervention materials. However, other studies have used the approach in sexual health and DRV interventions[9,28,39] and interventions in educational settings.[39,40] These studies have employed similar strategies of iterative refinement combining engagement with key stakeholders. For example, the JACK trial,[39] a phase III UK-wide cRCT of a school-based relationship and sexuality education intervention focusing on engaging young men in reducing adolescent pregnancy and promoting positive sexual health, involved a process of refinement of its intervention materials. They aimed to produce a culturally refined version of the intervention's interactive video and classroom materials. The refinement process involved face-to-face workshops with young people to refine intervention materials (i.e. an interactive video) with subsequent feedback via teleconferencing on amended intervention materials (i.e. video script) and digital feedback on the final resource. Refinements to the JACK trial's classroom intervention materials were based on consultations with teachers and relationships and sexuality education experts and a Relationships and Sexuality Education (RSE) stakeholder group with representatives from across the UK.[39]

Similarly, Ponsford *et al.* report on the optimisation process for two whole-school sexual health interventions for English secondary schools (Positive Choices and Project Respect).[29] In these studies, optimisation involved a review by researchers and delivery partners of evaluation reports and intervention materials which informed the intervention components. This was followed by initial consultation with secondary school staff and students on the intervention content, delivery and materials. Subsequently, intervention materials were drafted by the delivery partners in collaboration with research staff, followed by further consultation with schools, youth groups and policy stakeholders. Further refinements were made before piloting the intervention.

The optimisation method we employed was based on the model developed by the ASSIST-FRANK study[40] which described stages for developing and prototyping interventions. Their approach advocates for an evidence review and stakeholder consultation (i.e. focus groups/ interviews with relevant stakeholders, observations of

current practice and stakeholder consultation), followed by a process of coproduction (i.e. where the research team and key stakeholders coproduce the intervention materials and resources over a series of meetings via an action research cycle[41,42] of delivery, feedback and revision). The final stage involves prototyping, whereby intervention materials go through expert review and are delivered in a practice run of intervention delivery.[40]

Future research

Future research should focus on conducting a definitive trial to evaluate the effectiveness and cost-effectiveness of the SaFE intervention. In addition, further work is needed to explore strategies for enhancing the scalability and sustainability of such interventions across diverse educational settings. There is also a need to develop clearer guidance on the operationalisation of intervention optimisation, including standardised stages and methods, to support consistent and rigorous development of public health interventions.

The optimised intervention was delivered in a two-arm repeated cross-sectional pilot cRCT of SaFE compared to usual practice, including a process evaluation and an economic assessment in eight FE settings in England and Wales (six intervention and two control). The primary outcome was progression criteria relating to: FE setting and student recruitment; the acceptability of the intervention; and qualitative data, and documentary evidence from students, staff and sexual health nurses on acceptability, fidelity of implementation and receipt. The full trial results are reported elsewhere.[20] Three of the four progression criteria were met; SaFE was implemented with fidelity to the programme theory and was well received by students, staff and onsite sexual health nurses.

Lessons learned

Several key lessons emerged from the multistage iterative optimisation process involving experts and stakeholders. Engaging a diverse group of sexual health, domestic violence, public health and educational professionals and practitioners throughout this process proved essential for ensuring the relevance and accuracy of the materials. Feedback emphasised the need for clarity, facts and scenario-based learning in staff training, so content could be easily understood and applied in practice. The incorporation of contemporary issues, such as sending sexually explicit content and digital abuse, ensured that the training remained accessible and comprehensive and pertinent to the current diverse needs of FE student experiences. Stakeholders emphasised the need for training to be inclusive to people from different cultures and sexual identities. Young people noted the need for engaging visuals to enhance engagement with onsite services.

Streamlining content by reducing slide count and definitions and focusing on practical examples helped to foster better engagement among participants. The integration of varied learning approaches, such as group and task-based exercises, allowed for the accommodation of different learning styles and preferences. The use of multimedia elements and case studies at the beginning of each module was effective in capturing participants' attention and fostering engagement.

Feedback from participants, including young people, was vital for refining the training materials, ensuring they resonated with the target audience. This iterative process underscored the importance of continuous optimisation through ongoing adaptations to maintain the relevance of interventions in real-world contexts. Overall, these lessons contribute to a deeper understanding of how to enhance training within FE settings, ultimately fostering a safer and more supportive educational environment.

Strengths and limitations

The study adopted a structured, multistage approach to ensure comprehensive stakeholder involvement. By gathering input from a diverse range of stakeholders, the study made the materials more relevant to those directly engaged in the FE environment. This collaborative approach was designed to refine the training materials to better address the specific needs of both students and staff. The study's strength also lies in its reliance on subject matter experts from fields such as sexual health, domestic violence, sociology, public health and education. This expert input ensured that the training materials were evidence-based and grounded in the latest research and best practices. Throughout the development process, the research team maintained an iterative feedback loop with stakeholders, allowing for continuous enhancements that improved both the clarity and the practical applicability of the materials.

Despite these strengths, the study faced several limitations. Focus groups were composed of relatively small, self-selecting samples, which may limit the generalisability of the findings to the broader student population. Additionally, COVID-19 restrictions necessitated conducting all sessions online, which may have impacted the depth of interaction and engagement among participants. Moreover, since recruitment was limited to a single institution, there is a risk of bias that could influence the broader applicability

of the findings. To alleviate this, it may also be possible to further integrate optimisation processes into pilot trials. Real-time data collection during these stages could enable ongoing refinements to training materials, ensuring that they continue to evolve in response to the dynamic needs of students and staff within FE settings.

Conclusion

Sexual health, DRV and sexual harassment are key public health concerns, with potential short- and long-term adverse outcomes, especially for young people. FE settings offer a valuable platform for delivering preventative interventions at scale. Using a multistage, iterative process, we optimised training and publicity materials with stakeholders and experts to ensure relevance, clarity and inclusivity. A fully optimised set of staff training and publicity materials were produced, which were acceptable and consistent with the theory of change as agreed by the research team, TSC, stakeholder advisory group, along with FE students, staff and young people. Stakeholders valued multimedia, scenario-based learning and cultural responsiveness. Our approach reflects established public health models, yet highlights the lack of formal guidance on optimisation. The optimised intervention was delivered in a two-arm, repeated cross-sectional pilot cRCT of SaFE compared to usual practice, including a process evaluation and an economic assessment in eight FE settings in England and Wales (six intervention and two control). The primary outcome was progression criteria relating to: FE setting and student recruitment; the acceptability of the intervention; and qualitative data, and documentary evidence from students, staff and sexual health nurses on acceptability, fidelity of implementation and receipt. The full pilot trial results are reported elsewhere.[20] Three of the four progression criteria were met; SaFE was implemented with fidelity to the programme theory and was well received by students, staff and onsite sexual health nurses. The results indicate that the study met three of the four progression criteria, and progression to a full-scale effectiveness trial is warranted, providing small improvements in student recruitment to the survey can be made.

Additional information

CRediT contribution statement

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Data-sharing statement

This is a qualitative study and therefore the data generated are not suitable for sharing beyond that contained within the manuscript. Further information can be obtained from the corresponding author.

Ethics statement

Ethical approval was obtained from the Cardiff University School of Social Sciences Research Ethics Committee (Reference: SREC/3397) on 23 October 2019 and from NHS Ethics (Reference: 20/WA/0090) on 9 April 2020.

Information governance statement

All personal information was handled in line with the Data Protection Act (2018) and the General Data Protection Regulation (EU GDPR) 2016/679. Cardiff University is the data controller and data processor (www.legislation.gov.uk/ukpga/2018/12/contents, https://gdpr-info.eu/).

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List of supplementary material

Report Supplementary Material 1
Template for Intervention Description and Replication checklist

Supplementary material can be found on the NIHR Journals Library report page (https://doi.org/10.3310/AHDP8546).

Supplementary material has been provided by the authors to support the report and any files provided at submission will have been seen by peer reviewers, but not extensively reviewed. Any supplementary material provided at a later stage in the process may not have been peer reviewed.

The supplementary materials (which include but are not limited to related publications, patient information leaflets and questionnaires) are provided to support and contextualise the publication. Every effort has been made to obtain the necessary permissions for reproduction, to credit original sources appropriately, and to respect copyright requirements. However, despite our diligence, we acknowledge the possibility of unintentional omissions or errors and we welcome notifications of any concerns regarding copyright or permissions.

List of abbreviations

ALPHA	advice leading to public health advancement
DRV	dating and relationship violence
FE	further education
PPI	patient and public involvement
SAFE	Sexual Health and Healthy Relationships for Further Education
STI	sexually transmitted infection
TSC	Trial Steering Committee

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