July 2023 Report

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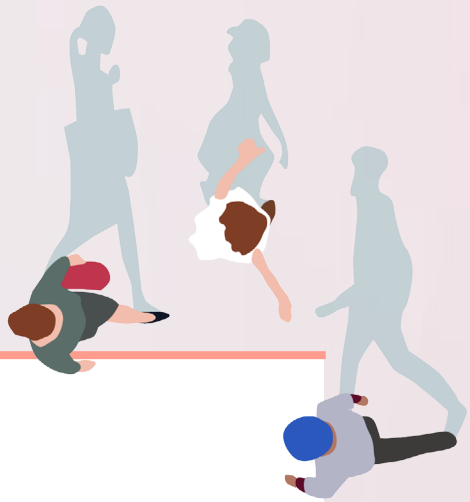

Evaluation of E-learning Training Module for Social Workers Supporting LGBTQ+ Young People in England

July 2023

What Works *for* Children's Social Care

Acknowledgments

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What Works for Early Intervention and Children's Social Care was the operating name of the organisation formed through the merger of What Works for Children's Social Care (WWCSC) and the Early Intervention Foundation (EIF) before our launch as Foundations – What Works Centre for Children & Families. The new single What Works centre covers the full range of support for children and families from preventative approaches, early intervention and targeted support for those at risk of poor outcomes, through to support for children with a social worker, children in care and care leavers. We believe all children should have the foundational relationships they need to thrive in life. By researching and evaluating the effectiveness of family support services and interventions, we're generating the actionable evidence needed to improve them, so more vulnerable children can live safely and happily at home and lead happier, healthier lives. Find out more: www.foundations.org.uk / www.whatworks-csc.org.uk

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CONTENTS

ACRONYMS AND ABBREVIATIONS

CPD	Continuing Professional Development
CRSi	The Centrality of Religiosity Scale
HABS	Heteronormative Attitudes and Beliefs Scale
IPE	Implementation and Process Evaluation
LGBTQ+	Lesbian, Gay, Bisexual, Transgender, Queer or Questioning
LYPSA	LGBTQ+ Young People in Social Care
MRC	Medical Research Council
OSF	Open Science Framework
pRCT	Pragmatic Randomised Controlled Trial
QYCC	Queer Youth Cultural Competency Scale
SOGIE	Sexual Orientation, Gender Identity and Gender Expression
UK	United Kingdom
USA	United States of America

EXECUTIVE SUMMARY

Introduction

LGBTQ+ young people have a range of unique social care needs that are often not addressed. Knowledgeable, affirming and competent social workers are hugely important to this groups' wellbeing and resilience; however, reviews of the international evidence suggest a lack of knowledge and guidance about supporting LGBTQ+ young people (Kaasbøll et al., 2021; Schaub et al., 2022a). In addition, this oversight means that negative attitudes towards LGBTQ+ young people could go unchallenged. The evidence base frequently recommends LGBTQ+ diversity training but large, well-conducted studies evaluating the effectiveness of these programmes for social workers are missing (Hunt et al., 2019; Schaub et al., 2022a).

This study sought to evaluate the effectiveness of an e-learning training module for improving social workers' knowledge of, and attitudes towards, LGBTQ+ young people in England. To the best of our knowledge, this is the first large randomised controlled trial conducted with children's social workers on this topic in the UK and internationally. The intervention was an existing e-learning training module from Stonewall, a leading LGBTQ+ human rights charity, for professionals that work with children and young people, already used widely by 39 local authorities in England.

This study forms part of the wider LGBTQ+ Young People in Social care (LYPSA) project which seeks to improve LGBTQ+ young people's social care experiences in England. Led by Dr Jason Schaub from the University of Birmingham, the project comprises three separate research studies. First was a PRISMA-compliant (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) systematic scoping review concerning the health and wellbeing experiences of LGBTQ+ young people in out-of-home care and the first qualitative study exploring the residential care experiences of LGBTQ+ young people in England. The project includes significant engagement and collaboration with a young advisors' group, comprised of LGBTQ+ young people with lived experiences of social care, and stakeholder groups that are connected to LGBTQ+ young people in out-of-home social care.

Research questions

We sought to answer the following research questions:

Primary Research Questions

- RQ1: How effective is the training course in changing social workers' heteronormative and cisnormative attitudes and beliefs about LGBTQ+ young people?
- RQ2: How effective is the training course in changing social workers' perceived knowledge about LGBTQ+ young people?

Secondary Research Question

- RQ3: Are the effects moderated by previous employer and external LGBTQ+ knowledge training?

Exploratory Research Questions

- RQ4: Are the effects moderated by age?
- RQ5: Are the effects moderated by gender?
- RQ6: Are the effects moderated by religiosity?
- RQ7: Are the effects moderated by connection to the LGBTQ+ community?

Methods

We used a pragmatic randomised control trial design (pRCT) to test the effectiveness of the online training course. All participants completed an online pre-test examining the primary outcome measures heteronormative attitudes and beliefs, using the Heteronormative Attitudes and Beliefs Scale (HABS, Habarth, 2015), and their perceived knowledge about LGBTQ+ young people, using a self-constructed knowledge scale adapted from a cultural competency test aimed at people engaging with LGBTQ+ young people (Gandy-Guedes, 2018). We also collected data on 1) previous employer and external LGBTQ+ knowledge training, 2) age, 3) gender, 4) religiosity (CRSi-7; Huber & Huber, 2012), and 5) connection to the LGBTQ+ community. After the pre-test participants were randomised (at the individual level) to either the intervention condition, receiving the online training, or the control condition, undergoing business as usual training conditions provided by their employer or local authority such as general staff Equality and Diversity training. Subsequently, participants completed an online post-test examining heteronormative attitudes and beliefs, and perceived LGBTQ+ knowledge. The time between pre-test and post-test varied between two weeks and three months. The post-test for participants in the intervention condition also enquired about their experience of taking part in the training.

In total, 1512 people registered for the study, of which 927 were eligible to participate. Six-hundred and fourteen people completed the pre-test and were randomised, with 304

participants in the intervention group and 310 participants in the control group. The post-test was completed by 188 of participants in the intervention group and 278 participants in the control group, making the final sample for analysis 466.

We recruited a sample that broadly represented the children's social work workforce (via age, gender and ethnicity), and included 2% of the total population, but it is important to acknowledge that the sample for this study was self-selected, and may be more receptive to learning about LGBTQ+ issues, which could bias the findings on effectiveness. This limitation will be discussed in the Discussion section including implications for future research.

We tested the effectiveness of the training on the two primary outcome measures (1) heteronormative attitudes and beliefs, 2) perceived LGBTQ+ knowledge). We also explored whether the other outcome measures (1) previous LGBTQ+ knowledge training, 2) age, 3) gender, 4) religiosity, 5) connection to the LGBTQ+ community) moderated the effectiveness. Additionally, we conducted some subgroup analyses for interest and for future research, but these are, inevitably, under-powered. Quantitative data on the effectiveness of the training were analysed using inferential statistics in IBM SPSS Statistics Version 28 (IBM Corp., 2021). We took a modified intention-to-treat approach for the primary outcome measures, reporting findings using two different missing data imputation methods (mean imputation and last observation carried forward). Additionally, we reported analyses using a per protocol approach to compare findings. Lastly, we conducted sub-group analyses based on 1) years of experience, 2) sexuality, 3) gender identity, 4) age and 5) connection to the LGBTQ+ community.

Key findings

The analyses yielded the following findings:

- At post-test, participants in the intervention condition had statistically significant **lower** (better) scores on the heteronormative attitudes and beliefs scale than participants in the control condition in the majority of our models
- On the post-test, participants in the intervention condition had statistically significant **higher (better)** scores on the perceived LGBTQ+ knowledge scale than participants in the control condition
- We did not find strong evidence for any moderators affecting the effectiveness of the training

- Participants who had completed the training were satisfied with the training and felt more confident about being able to support LGBTQ+ youth
- Our findings provide preliminary evidence that the training might be more effective at decreasing heteronormative attitudes and beliefs for children's social workers who: 1) have 0-10 years of experience, 2) identify as straight, 3) identify as a woman, 4) have a connection to the LGBTQ+ community, or 5) are over 35 years old.

Discussion

This study was the first RCT testing the effectiveness of an LGBTQ+ knowledge e-learning training module for children's social workers. Overall, our analyses provide initial evidence for the effectiveness of the e-learning training module. We opted for the use of several analysis approaches and missing data imputation methods to explore the robustness of the results. We found effects for all analysis and imputation methods except one (attitudes as measured by HABS when tested by LOCF).

Although the change in both knowledge and attitudes was significant, the effects were larger for knowledge increase. This discrepancy seems intuitive, as the main theory of change of the training was to increase participant's knowledge on LGBTQ+ young people and their support needs. Surprisingly, we did not find any strong evidence for significant moderators, suggesting that the intervention is similarly effective for all participant groups. It will be important to test whether the increased knowledge improves social work practice. Our findings echo consistent calls within the literature for training for social workers about sexual orientation and gender identity, and the rights of LGBTQ+ young people in care.

Conclusion and recommendations

We can conclude that there is initial evidence that the e-learning training module is effective at supporting children's social workers to increase their knowledge about LGBTQ+ young people and the issues they face. We developed the following recommendations drawing on the findings.

Research recommendations:

- Future research should test the longitudinal replication of these findings, and examine whether training effects are durable
- Future studies should explore the impact of the training on the practice of children's social workers
- Future studies should assess how the training can be optimised for the social work profession, in particular in combination with coaching and/or supervision.

Practice and policy recommendations:

- We recommend policy makers should consider implementing LGBTQ+ training for all qualified social workers and consider implementing such training within pre-qualifying social work courses
- Greater support by councils is needed for social workers to participate in research in general, and experimental trials in particular.

INTRODUCTION

Project background

Until recently, little attention has been given to the experiences of lesbian, gay, bisexual, transgender and queer or questioning (LGBTQ+) young people in the social care system, or social workers' needs supporting them. Our systematic scoping review of the international evidence, mostly from the USA, demonstrates that LGBTQ+ young people are significantly more likely to end up in social care and experience poorer health, mental health and wellbeing outcomes compared to their cisgender (non-transgender) and heterosexual peers while in care (Schaub et al., 2022a). Estimates from the review suggest that this overrepresentation is far greater for those from racial or ethnic minority backgrounds. Although many LGBTQ+ young people enter care for the same reasons as their peers (e.g. abuse, neglect), they often experience sexual orientation, gender identity and expression (SOGIE) related rejection, marginalisation and discrimination – from initial referral through to aging out or leaving care (Kaasbøll et al., 2021; Schaub et al., 2022a). Their experience includes greater placement instability and more frequent residential or group home placements compared to non-LGBTQ+ youth in care (Schaub et al., 2022a), which have been linked to poorer mental health outcomes (Evans et al., 2017; Ford et al., 2007). Although there is limited data in the UK, two foundational studies observe similar patterns. LGBTQ+ young people in foster and residential care in England report experiences of cis/heteronormative environments, often delaying disclosure of their SOGIE, and homo/bi/transphobic harmful encounters with peers, care professionals and residential workers (Cossar et al., 2017; Schaub et al., 2022b). Little data are available about the experiences of transgender and gender diverse young people in care, but the available research suggests heightened challenges among this group (Mountz et al., 2018; Schaub et al., 2022a, 2022b). Given these findings it is not unsurprising that LGBTQ+ young people report greater dissatisfaction with care services and have specific social care needs compared to non-LGBTQ young people (Schaub et al., 2022a).

Social workers also report a lack of knowledge and training on how to adequately support LGBTQ+ young people, both in the UK and internationally (Schaub et al., 2022a). Several studies indicate a lack of confidence, knowledge, and preparedness among pre- and post-qualifying social workers in England to practice competently with LGBTQ+ people, and transgender and gender diverse people especially (Inch, 2017; Schaub et al., 2017). There is little explicit reference in social work education ofLGBTQ+ affirming policies and

guidelines regarding working with LGBTQ+ young people (Cossar et al., 2017 Schaub et al., 2022a). International studies found that social workers and social work students sometimes hold neutral or even negative attitudes toward LGBTQ+ people, and bisexual and/or transgender people in particular (Atteberry-Ash et al., 2019; Greeno et al., 2021; Logie et al., 2007; Swank & Raiz, 2010; Weeks et al., 2018). Similarly, a survey carried out by Stonewall, a leading LGBTQ+ human rights charity, found that almost six in ten health and social care practitioners did not consider a young person's LGBTQ+ identity relevant to their care needs and a quarter of respondents did not feel confident in their abilities to support trans service users (Somerville, 2015). A national survey of local authorities in England found that while 38% of local authorities had a general care policy that included LGBTQ+ young people, only 5% had a LGBTQ+ specific policy, and recording of LGBTQ+ identities was rare (Cossar et al., 2017). Positive and affirming relationships have been shown to be incredibly important to the resilience of this population (Schaub et al., 2022b), and these findings necessitate that care systems work towards a goal of increasing the workforce's knowledge and competence in this terrain.

One of the most common recommendations from the literature and best practice guidelines is the need for LGBTQ+-specific knowledge training programmes to better support this group. This stems from the belief that negative attitudes and behaviours towards LGBTQ+ people can be challenged through education (Westwood & Knocker, 2016), and several studies have demonstrated promising results in this regard among other helping professions. For example, systematic reviews found that educational training programs are effective at improving self-reported knowledge and promoting more tolerant attitudes about the LGBTQ+ community among medical, nursing and mental healthcare providers (Bettergarcia et al., 2021; Morris et al., 2019; Yu et al., 2023). Similarly, studies also found that professional training on LGBTQ+ issues have significant positive effects on schoolteachers' and educators' beliefs and attitudes toward LGBTQ+ young people (Greytak et al., 2013; Szalacha, 2003). Despite the availability of appropriate training programmes (Hunt et al., 2019). Very little is known about the effectiveness of such training with children's social workers. Findings from a recent non-randomised pre- and post-test study of an in-person LGBTQ+ competency training programme with social workers in the USA was found to be effective in increasing knowledge of LGBTQ+-related (Weeks et al., 2018). Most of this evidence, however, comes from USA context with a scarcity of large, rigorously conducted studies, such as randomised controlled trials, providing robust evidence on the topic with social workers in the UK and internationally (Hunt et al., 2019; Schaub et al., 2022a).

This report presents findings from the first randomised controlled trial evaluating the effectiveness of an e-learning training module for social workers supporting LGBTQ+ young people in England. The use of e-learning training modules can be a potentially effective, low-cost strategy to provide ongoing professional development and improve professionals' knowledge and attitudes towards LGBTQ+ young people. The major benefit of e-learning over traditional face-to-face training programmes is the increased accessibility and flexibility where learners can access the training at any time and from any location, provided they have access to Internet. Additionally, in comparison to in-person training, e-learning training modules can be developed and maintained with limited resources and offered at a low price to learners and their employers. This is particularly important in contexts where there are ongoing developments, such as the policy and legal landscape concerning LGBTQ+ rights.

The Intervention

In this study, we tested an e-learning training module, *Supporting LGBTQ+ Children and Young People,* developed by Stonewall (a leading LGBTQ+ human rights charity). This CPD-accredited and self-guided e-module was designed to improve the knowledge, skills and confidence of professionals that work with children and young people (including social workers), by offering essential information, practical advice and interactive activities related to the needs or experiences of LGBTQ+ young people. It includes information around LGBTQ+ terminology and identities; the law and practice obligations in relation to LGBTQ+ young people; strategies to prevent homo/bi/transphobic bullying and language; and signposting resources. Content for the e-learning course was drawn from Stonewall's long-running experience training children and young people's service staff on LGBTQ+ issues as well as consultation with a range of stakeholders including LGBTQ+ young people and academics. The intervention is widely used across England by 39 local authorities. The current price of the intervention is £35 per user.

This study evaluated the impact of this training on social workers' LGBTQ+-related knowledge and heteronormative attitudes and beliefs, compared to a business-as-usual control group in which participants might undertake general staff Equality and Diversity training conditions provided by their employer or local authority. Given the absence of internationally available data, this study provides foundational knowledge. We had two primary hypotheses:

1. Compared to comparison group participants, intervention group participants will increase their LGBTQ+ knowledge. It is expected that the score on the LGBTQ+

knowledge scale will increase between the pre- and post-test for the intervention group and remain similar for the comparison group.

2. Compared to comparison group participants, intervention group participants will decrease in heteronormative attitudes and beliefs.

We also examined possible factors that might account for differences in these primary outcomes. The literature suggested several factors that may facilitate, or inhibit, the effectiveness of LGBTQ+ knowledge programmes. For example, previous studies found that younger generations tend to have more positive attitudes towards LGBTQ+ communities compared to older populations (Gandy-Guedes, 2018). Research also indicates that women display more favourable attitudes towards LGBTQ+ people than men (Dotti Sani & Quaranta, 2020; Herek, 2002), and there is a close connection between religious affiliation, or religiosity, and social workers' negative attitudes towards LGBTQ+ people (Westwood, 2022). Finally, having a close friend or family member who identifies as LGBTQ+ has been linked to greater LGBTQ+ knowledge and positively supportive behaviours in a recent survey with care professionals in the USA (Greeno et al., 2021). As a result, moderators such as age, gender identity, religiosity, connection to the LGBTQ+ community, and previous training were included as covariates in this study.

METHODS

Research questions

The research questions we sought to answer are:

Primary Research Questions

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- RQ7: Are the effects moderated by connection to the LGBTQ+ community?

Protocol registration and ethical review

The trial was registered on the Open Science Framework (OSF). Ethical approval was obtained from The University of Birmingham (ERN_21-1629) in April 2022. All participants signed electronic informed consent before participating and were free to withdraw at any point before conclusion of the study.

Research design

Design

This study used a two-armed, pre- and post-test, pragmatic RCT (pRCT) design combined with a census-style process evaluation. pRCTs measure the effectiveness of an intervention in 'the real word', more specifically, under usual conditions of care (Zwarenstein et al., 2008). Participants were individually randomised to either the intervention or comparison group. Intervention participants were provided access to the Stonewall e-learning training module, and the comparison group followed a 'business as usual' model, which could include training

provided by employers as part of their normal offer. The pRCT design was appropriate for this study for three key reasons: 1) The e-learning intervention is in wide use, making it important to test its effectiveness, 2) a number of cohort studies of education programmes suggest this is promising way of informing social workers about sexuality and gender (Inch, 2017; Schaub et al., 2017), and 3) there was sufficient recruitment power to conduct a pRCT that would provide meaningful results.

The census-style process evaluation was conducted in accordance with key Medical Research Council (MRC) guidance (Moore et al., 2015) and conducted with respondents in the intervention group as part of the post-test upon completion of the intervention. It was designed to assess the intervention delivery to understand and explain any identified intervention effects (or lack thereof) (see Schaub et al., 2022b for further details on design and conduct). Additionally, it aimed to understand participant satisfaction with training programme elements and identify any suggested changes for improvement. The decision behind a census-style process evaluation came down to initial concerns around sample size and response rate in the intervention group (prior to data collection) and done to maximise the number of respondents completing the process evaluation.

This trial was analysed and reported in line with the CONSORT-SPI reporting guidance (Montgomery et al., 2018) and a checklist is provided as Appendix A. This study followed a published protocol (Schaub et al., 2022c) and used co-production techniques involving a range of stakeholders, including social care professionals and, importantly for social work research, a group of LGBTQ+ young people (16 to 24) with lived experiences of social care. Study design and conduct incorporated feedback from stakeholders at different stages of development, implementation and evaluation. We also solicited stakeholder perspectives on drafted practice and policy recommendations. Stakeholders met virtually bi- to tri-annually over the course of the project to seek agreement on key decisions. More detailed discussions on our co-production approach to follow separately in a forthcoming journal article led by our young advisory group.

A paucity of similar studies in the literature meant that we were unable to carry out an *a priori* power analyses with real certainty. Nevertheless, a meta-analysis of anti-bias, multicultural, and moral education training programmes aimed at reducing prejudice, concludes that a small to medium effect of d = .23 is common for large scale samples (Paluck et al., 2021). Based on this effect size, it was estimated that we required 298 participants in each trial arm (for 80% power, 0.05 significance level).

Conditions

Intervention arm: Stonewall e-learning training module

We described the intervention in Table 1 below following the Template for Intervention Description and Replication (Hoffman et al., 2014).

Table 1. TIDieR table for the Intervention Arm

Brief name
1. The intervention was an existing e-learning training module titled *Supporting LGBTQ+ Children and Young People* delivered by Stonewall.
Why
2. The training is specifically tailored to, and widely used by, local authorities in England and was offered to participants free of charge (normally £42 (incl. VAT) per person). This CPD-accredited e-module was designed to improve the attitudes, knowledge, skills, and confidence to support LGBTQ+ youth.
What
3. The training consisted of four learning units: 1) LGBTQ+ terminology, experiences and intersecting identities; 2) the law and practice obligations in relation to LGBTQ+ inclusion; 3) strategies to prevent and tackle homo-, bi- and transphobic bullying and language, and; 4) appropriate signposting. The training can be accessed on the Stonewall website (www.stonewall.org.uk/e-learning)
4. Learners were provided with essential information, practical advice, and interactive activities that encourage consideration of how LGBTQ+ inclusive practice can be embedded in their own setting.
Who provided
5. The intervention was delivered by Stonewall, a leading LGBTQ+ human rights charity.
How
6. The training was provided online. Participants allocated to the intervention group received log in details via email and could complete the training individually in their own time.
Where
7. The training could be accessed on any device with internet, at work or at home.
When and How Much
8. In total, it took between two and four hours to complete the training. This could be done in one sitting, or by completing sections at several time points when time allowed. Depending on when participants registered, they had between two weeks and three months to complete it.
Tailoring
9. The intervention was the same for each participant.
Modifications
10. There were no major modifications to the intervention. Minor modifications/adjustments were made by the research team to content such as a case study examples to better reflect social work settings or practice.
How well
11. Participants could only continue to the next unit if they had completed the previous one. They were only referred to the post-test survey and offered a remuneration in the form of

	£10 voucher if the training had been fully completed. The research team had access to Stonewall's online training platform which allowed them to check progress.
12.	Only participants who had fully completed the training were included in the analysis.

Control arm: 'Business as usual'

Participants in the control group received an email informing them that they would undergo business-as-usual training conditions as provided by their employer (e.g. general Equality and Diversity training which is mandatory in the UK), and that they would be contacted in November 2022 to capture such training and complete the post-test. There was no further contact between the control group and the research team until the post-test collection. Whilst this posed a risk for attrition, this approach reflects the pragmatic nature of this trial and approximates the real-word context. We recognise that there would be considerable heterogeneity within this group as business-as-usual is likely to vary across social work departments across the country. However, this variability forms a sound, pragmatic basis from which to compare the intervention. The post-test for the control group asked about any substantial training on LGBTQ+ related issues that had been undertaken since participation in the study. Only sixteen out of 278 (5.75%) answered affirmatively, and described their training consisted of workshops or external educational resources. It may also be the case that some participants may have accessed the intervention (contamination).

Randomisation

Participants who had provided consent and completed the pre-test were randomly assigned to the intervention group or control group using web-based allocation. Participants were individually randomised and occurred continuously throughout the trial. For monitoring purposes, the research team undertook six-weekly balance checks to identify any imbalances. The research team was not blind to participant grouping but was unaware of allocation at the start of the trial due to the web-based allocation. Furthermore, while participants were aware of their allocation (given the pragmatic nature of the intervention), they were unaware of other participants' allocation.

Data Collection

Measures

The primary outcome measures for this study were heteronormative attitudes and beliefs and perceived LGBTQ+ knowledge. The pre- and post-test aim was to detect changes in the two outcome measures before and after randomisation.

Outcome measure 1: Heteronormative attitudes and beliefs

Heteronormative attitudes and beliefs were measured with the 16-item *Heteronormative Attitudes and Beliefs Scale* (HABS; Habarth, 2015), which assesses participants' heteronormative attitudes, as well as including elements of gender identity (see Appendix B). Questions are answered on a 7-point Likert scale, ranging from *Strongly disagree* to *Strongly agree.* The HABS produces an overall score with excellent internal reliability (α = .91) and consists of two subscales, Essential Sex and Gender, which has excellent reliability (α = .92), and Normative Behaviour, which has acceptable reliability (α = .78). Items 1, 4, 9, 11, 12, 15 and 16 are reverse coded, and the maximum score is 112. Higher scores indicate stronger heteronormative attitudes and beliefs. This scale has successfully been used in previous research with UK social workers (Schaub et al., 2017) and its psychometric qualities have been tested widely (Habarth, 2015; Duncan et al., 2019; Scandurra et al., 2021).

Outcome measure 2: Perceived LGBTQ+ knowledge

To assess social workers' perceived LGBTQ+ knowledge of social workers in working with LGBTQ+ populations, we adapted the queer youth cultural competency (QYCC) scale measuring LGBTQ+-related knowledge, attitude, skill and awareness (Gandy-Guedes, 2018). Our adapted version is a 5-item perceived LGBTQ+ knowledge measure adapted according to knowledge components that closely reflected core components or key activities of the intervention as determined by our theory of change model see Appendix C, which we developed through training programme observation, reviews of programme documentation, and in a series of discussions with both advisory groups (see table 2 below for example adaptations). Questions are answered on a 5-point Likert scale, ranging from *Strongly disagree* to *Strongly agree.*

Table 2. Adapted QYCC scale items

QYCC Scale Items	Adapted Items
I attempt to learn and use terms that reflect LGBTQ+ youth culture so that I communicate more effectively with youths that I interact with.	I feel knowledgeable about terms and stereotypes relating to LGBTQ+ young people's identities.
Adolescents (ages 12-17) are not old enough to know whether they are gay/lesbian/bisexual or straight.	Children under the age of 13 are too young to know whether they are LGBTQ+ or not.

Children (ages 5-11) are too young to be thinking about whether they are transgender or not.	
When possible, I do or would connect an LGBTQ+ youth to LGBTQ+ resources in the community.	I know how to connect an LGBTQ+ young person to relevant LGBTQ+ resources in the community.

There are few adequate instruments widely used to measure LGBTQ+ knowledge among health and social care practitioners (Gandy-Guedes, 2018). We selected the QYCC as it was developed to avoid the influence of social desirability (i.e., the tendency for people to present themselves in a generally favourably fashion), and demonstrated little or no influence according to initial evidence as per the author. Our adapted questions are answered on a 5-point Likert scale, ranging from *Strongly agree* to *Strongly disagree* (see Appendix B). The full scale was shortened to 5 items to limit the time burden on participants. Items 3 and 4 are reverse scored, and the maximum score is 25. Higher scores indicate greater knowledge about the LGBTQ+ community.

During the pre-test, the following data on participant characteristics were collected: age, gender identity, sexual orientation, years of working experience, ethnicity, and previous LGBTQ+ training. Additionally, data on religiosity and connection to the LGBTQ+ community were gathered with the following measures.

Religiosity

Religiosity was measured with the 7-item *Interreligious Centrality of Religiosity Scale* (CRSi-7) (Huber & Huber, 2012), which measures five core dimensions of religiosity (intellect, ideology, public practice, private practice and experience) and is suitable for both Abrahamic and non-Abrahamic religions (see Appendix B). There are very high correlations between the measure and self-reports of religious identity (r = .83). Responses are recorded with 5-point Likert style items focussed either on frequency (very often, often, occasionally, rarely, never) or level of importance (very much so, quite a bit, moderately, not very much, not at all).

Connection to the LGBTQ+ community

Participants were asked if they have any close friends or family who identify as LGBTQ+. The response options included yes, no, or prefer not to say.

Process evaluation

In addition to the outcome data collected to analyse the effect of the intervention on heteronormative attitudes and LGBTQ+ knowledge, the post-test for the intervention group included ten process evaluation questions to assess the training programme's acceptability, implementation, mechanism, and context. The process evaluation included both open and multiple-choice questions.

Table 3. Data collected in this evaluation

Pre-test survey (June-Nov 2022)	304	314
Post-test survey (Nov 2022)	188	278

Sample recruitment and selection criteria

Individuals were eligible to participate if they met all four inclusion criteria: 1) participants must be employed by a local authority in England, 2) participants must work in children's social care services, 3) participants must be registered with Social Work England, and 4) participants could not have previously completed a Stonewall e-learning training module. At registration, participants were asked to share their Social Work registration number and their local authority email address to ensure eligibility. Recruitment was guided by the dispersed nature of the social care sector, as well as the scale of the study. Participants were recruited using a number of sampling strategies on a rolling basis throughout the duration of the data collection. Firstly, we used existing connections with social work networks and connections to disseminate the recruitment call. Secondly, we undertook a substantial social media campaign advertising the study on Twitter, LinkedIn and Facebook. Thirdly, we approached individuals based on their specific position and knowledge (critical case sampling). Lastly, we used chain sampling, asking participants to forward the recruitment call to other potential participants (Onwuegbuzie & Collins, 2007). We adopted a rolling recruitment approach to be able to enrol enough eligible participants, which is a significant challenge when engaging with practising social workers (Harvey et al., 2013; Wakefield et al., 2022). The recruitment advert provided potential participants with a registration link to a Qualtrics (2020) page where eligibility was checked. Once a participant had registered and met the inclusion criteria, they received a Qualtrics link to the pre-test survey including a consent form; following this step participants were individually randomised. Intervention group participants

were automatically sent a link to the post-intervention test after completing the e-learning training module. Comparison group participants received a link to the post-intervention test a month before data collection ended. From November 2022, participants received weekly text and email reminders to complete the post-test. After completing the post-test, all participants (intervention and control group) received a thank-you email including a £10 e-voucher.

It is important to acknowledge that the sample for this study was self-selected, and therefore potentially represent a group who might be open to learning about LGBTQ+ issues, which could introduce bias to the findings on effectiveness. This limitation will be discussed in the Discussion section including implications for future research.

Data management and processing

All data were collected on Qualtrics (2020) and managed by the two Research Fellows on the project. Data were regularly checked for spam entries, which were removed. Once data collection had completed, they were downloaded in Excel for cleaning. During data cleaning, any entries that had not fully completed the pre- and/or post-test were removed (e.g. only completed name and email address, but not any further questions). Subsequently, data were exported to SPSS Version 28 (IBM Corp., 2021) for analysis.

We took a modified intention-to-treat approach for the primary outcome measures (HABS and LGBTQ+ Knowledge Scale). This approach includes all participants who were randomised, irrespective of group allocation and of missing outcome data. This can be considered a conservative approach depending on the missing data imputation method, ensuring unbiased conclusions about intervention effectiveness (McCoy, 2017). Our ITT approach was modified as we were only able to administer post-test to those who had completed all the training. Findings are reported and compared for two approaches to missing data imputation: Baseline Observation Carried Forward and imputation of group means. Additionally, data are analysed following a per protocol approach to compare findings. Findings are reported following these three analysis approaches because data collection had started before an analysis plan had been agreed due to resourcing challenges in the evaluation team. It later became apparent that there would be missing data and imputation methods were required. Different imputation strategies have different implications for the interpretation of findings. Therefore, it was decided to report findings from both analysis approaches for full transparency. Further details about the analysis approaches and missing data computation approaches can be found below in the Findings section.

Qualitative data from the implementation and process evaluation were also downloaded from Qualtrics and processed in QSR NVivo.Analysis (QSR International, 2018).

Qualitative data analysis

Qualitative data from the implementation and process evaluation were analysed using conventional content analysis (Hsieh & Shannon, 2005). Coding was conducted using Nvivo 12 qualitative data management software and completed concurrently (QSR International, 2018). We first identified factors potentially key to implementation outcomes and suggestions for quality improvement/practice change. These were discussed with the advisory group to ensure alignment with sector applicability.

Quantitative data analysis

Quantitative data were analysed using IBM SPSS Statistics Version 28 (IBM Corp., 2021). Demographic data are presented using descriptive statistics. Effectiveness of the training and exploration of moderators are analysed using inferential statistics. Specifically, we conducted simple and multiple regression analyses to answer the research questions. The data file (and SPSS output) was split according to group before conducting ANOVAs to explore subgroup effects. Outputs were assessed at the .05 significance level. Multiple best-practice analysis approaches will be reported for reasons described above (see Data management section for details).

FINDINGS

This section will describe the findings of the study in the following order. First, we will describe the participant flow and participant characteristics. Then, we will discuss our analysis and missing data approaches. Finally, we will report the findings following the order of the research questions: 1) primary research questions (RQ1&2), 2) secondary research questions (RQ3), and 3) exploratory research questions (RQ4-7).

Participant flow In total, 1512 people registered for the study, of which 927 were eligible to participate. Participants were excluded if they did not meet the pre-specified inclusion criteria, spam sign-ups and non-response after invitation to pre-test (see Figure 1). Six-hundred and fourteen people completed the pre-test and were randomised, with 304 participants in the intervention group and 310 participants in the control group. The post-test was completed by 188 of participants in the intervention group and 278 participants in the control group, making the final sample for analysis 466.

Table 4 to 8 (See Appendix D) present the participant characteristics for both conditions in terms of gender identity, sexual orientation, religion, age, and years of experience as a social worker. The average age of our sample was approximately forty years (41.18 in the intervention group, 39.27 in the control group), in accordance with the national data (GOV.UK, 2022).

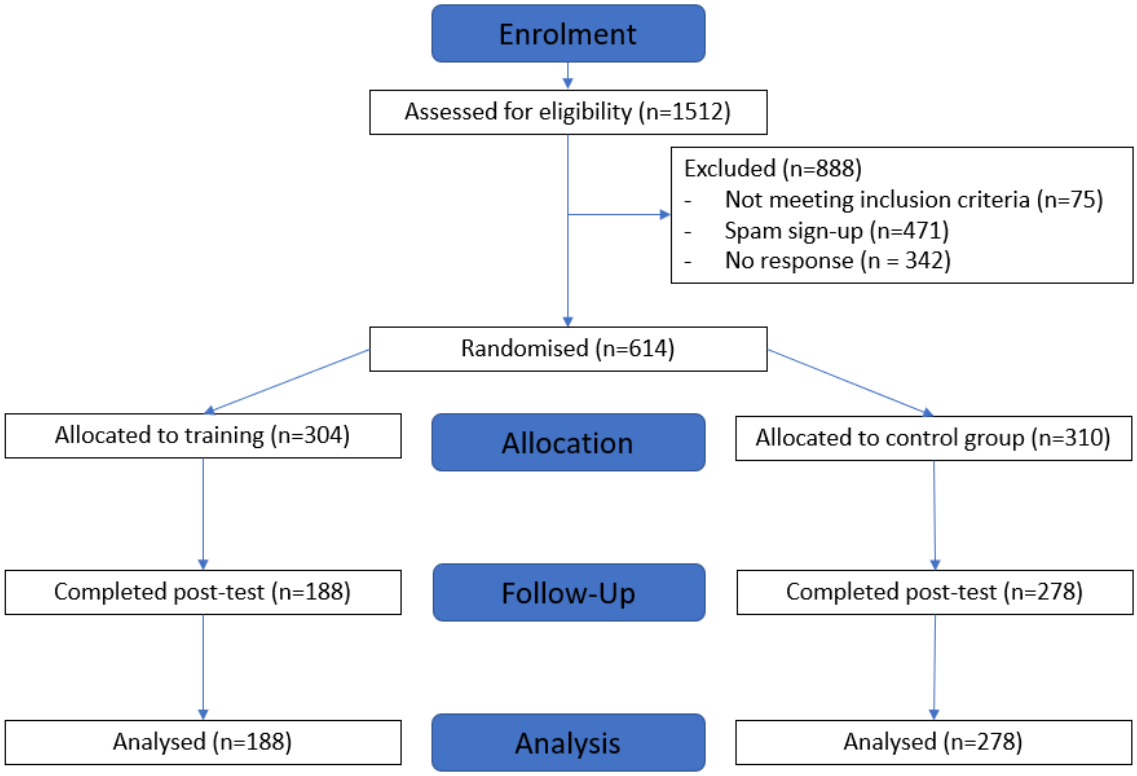

Figure 1. Participant Flow Diagram

Data Checks

Before running the main analyses, data were visually inspected and checked to meet assumptions of normality, homogeneity, and linearity.

Analysis approaches

The data are analysed and reporting following three different analysis approaches: 1) Intention-to-treat analysis with mean imputation of missing data, 2) Intention-to-treat analysis with Last Observation Carried Forward (LOCF) as imputation method, and 3) Per protocol analysis. The reason for this is to compare findings across analysis methods to examine the stability of findings. The selected analysis approaches both have advantages and disadvantages.

The intention-to-treat (ITT) approach includes all participants who were randomised, irrespective of group allocation and of missing outcome data. Our ITT approach was modified as we were only able to administer post-test to those who had completed all the training. In the literature, this is seen as a conservative approach in superiority trials, ensuring unbiased conclusions about intervention effectiveness (McCoy, 2017). However, due to its conservativeness, this approach is less likely to accept a novel intervention as

effective. We undertook the intention-to-treat using two different missing data imputation methods, which are described in the section below. Additionally, we present a per protocol analysis, in which only the data of the participants who completed both pre- and post-test are included. Per protocol analyses allow researchers to test the effect of actually having received the implemented intervention following the study protocol. However, the advantages of randomisation may be lost in this approach (Tripepi et al., 2020). We acknowledge the strengths and weaknesses of each approach, and report findings of both to increase transparency.

Missing Data

Analysis of patterns of missing data indicated that two variables had more than 1% missing data: HABS post-test (25.3%) and KNWL post-test (26.0%). Split by condition, it became evident that the intervention condition had 39.5% missing data for both post-tests, whereas the control condition had 11.2% missing data for the HABS post-test, and 12.5% missing data for the KNWL post-test, suggesting differential attrition. Differential attrition rates can be problematic for the internal validity of studies, which should be considered in the interpretation of findings. Previous research demonstrates that a higher attrition rate in the intervention condition is common (Crutzen et al., 2014), and this does not automatically bias the results (Hewitt et al., 2010). We do however note the differential attrition in the current study and will describe this as a limitation to the study in the discussion section.
Analyses of patterns of missing data in SPSS suggested that data were missing at random, meaning that those who did not complete the post-test did not significantly differ in terms of participant characteristics compared to those who did, based on variables selected from previous research, and in line with our protocol and discussions with our two stakeholder groups.

The following results are presented using an intention-to-treat approach with two different imputation strategies. Firstly, we will undertake analyses with mean imputation, using the post-test mean for each condition as imputation, which is a more positive approach to missing data, as is implies that all participants for whom data was missing experienced a positive treatment effect. In this approach, each missing value on the post-test will be replaced by the mean of the available data for that condition. Subsequently, we will describe analyses using the Last Observation Carried Forward approach (LOCF), in which missing data are imputed based on a participant's last observed score on the dependent variable(s). In this case, LOCF is identical to Baseline Observation Carried Forward, as we only have a pre- and post-test measure. This means that the participants for which we would impute outcome data based on their baseline observations automatically do not present with any

change between pre- and post-test (regardless of condition). Therefore, this is a more conservative approach to missing data in this context. Additionally, data are analysed and presented using a per protocol approach, in which no missing data is imputed as only participants with pre- and post-test data will have been included.

The Primary Outcome Measures

Table 9 provides details on the mean pre- and post-test scores on the two main outcome measures. On the pre-test, the intervention condition scored higher on the HABS scale (Intervention, *M* = 40.12; Control, *M* = 38.98), and lower on the KNWL scale (Intervention, *M* = 19.84; Control, *M* = 21.09). No other baseline differences were found between groups, except that an independent samples t-test indicated that there was only a significant difference between condition on the KNWL scale (Intervention *M* = 19.84, Control *M* = 21.09) on the pre-test, $t(622) = -4.356$, $p < .001$. This imbalance was not seen as problematic as baseline rates were higher in the control condition. Furthermore, pre-test score was controlled for in the analyses.

Table 9. Means and Standard Deviations on the HABS and KNWL Scale per Condition

	Intervention				Control			
	Pre		Post		Pre		Post	
	M	SE	*M*	SE	*M*	SE	*M*	SE
HABS	40.12	10.81	35.71	8.39	38.98	10.48	37.75	10.52
KNWL	19.84	3.62	24.11	2.41	21.09	3.55	21.79	3.47

Primary Research Questions

RQ1: How effective is the training course in changing social workers' heteronormative and cisnormative attitudes and beliefs about LGBTQ+ young people?

To answer this question, we present a linear regression analysis to test if condition significantly predicted scores on the post-test of the first primary outcome measure, heteronormative attitudes and beliefs (HABS). Results are reported in the following order: 1) ITT with mean imputation, 2) ITT with LOCF imputation, and 3) Per protocol.

ITT with Mean Imputation

The overall regression was statistically significant (R^2 = .015, F(1,622) = 9.185, p = .003). It was found that condition significantly predicted HABS scores on the post-test (β = .121, p = .003). Participants in the intervention condition scored lower on the HABS post-test than participants in the control condition, indicating fewer heteronormative attitudes and beliefs.

ITT with LOCF Imputation

The overall regression was not statistically significant (R^2 = .001, F(1,622) = .570, p = .451). It was found that condition did not significantly predict HABS scores on the post-test (β = .030, p = .451).

Per Protocol

The overall regression was statistically significant (R^2 = .010, F(1,460) = 4.720, p = .030). It was found that condition significantly predicted HABS scores on the post-test (β = .101, p = .030). Participants in the intervention condition scored higher on the HABS post-test than participants in the control condition, indicating fewer heteronormative attitudes and beliefs.

RQ2: How effective is the training course in changing social workers' perceived knowledge about LGBTQ+ young people?

To answer this question, we present a linear regression analysis to test if condition significantly predicted scores on the post-test of the second primary outcome measure, perceived LGBTQ+ knowledge (KNWL). Results are reported in the following order: 1) ITT with mean imputation, 2) ITT with LOCF imputation, and 3) Per protocol.

ITT with Mean Imputation

The overall regression was statistically significant (R^2 = .161, F(1,622) = 119.189, p < .001). It was found that condition significantly predicted KNWL scores on the post-test (β = -.401, p < .001). Participants in the intervention condition scored higher on the KNWL post-test than participants in the control condition, indicating higher knowledge.

ITT with LOCF Imputation

The overall regression was statistically significant (R^2 = .011, F(1,622) = 7.138, p = .008). It was found that condition significantly predicted KNWL scores on the post-test (β = -.107, p = .008). Participants in the intervention condition scored higher on the KNWL post-test than participants in the control condition, indicating higher knowledge.

Per Protocol

The overall regression was statistically significant (R^2 = .120, F(1,460 = 62.910, p < .001). It was found that condition significantly predicted KNWL scores on the post-test (β = -.347, p <

.001). Participants in the intervention condition scored higher on the KNWL post-test than participants in the control condition, indicating higher knowledge.

Secondary Research Questions

RQ3: Are the effects moderated by previous employer and external LGBTQ+ knowledge training?

To answer this question, we present multiple regression analyses for both primary outcome measures. Condition, previous employer training, and external training are predictor variables. Results will be reported in the following order: 1) ITT with mean imputation, 2) ITT with LOCF imputation, and 3) Per protocol.

ITT with Mean Imputation

HABS

The overall regression was statistically significant (R^2 = .016, $F(3,620)$ = 3.350, p = .019). It was found that condition significantly predicted HABS scores on the post-test (β = .121, p = .002). Previous employer training (β = -.030, p = .452) and previous external training (β = .022, p = .576) did not significantly predict HABS scores on the post-test. The effect of the intervention on HABS scores was not moderated by previous employer training or previous external training.

KNWL

The overall regression was statistically significant (R^2 = .162, $F(3,620)$ = 39.954, p < .001). It was found that condition significantly predicted KNWL scores on the post-test (β = -.401, p < .001). Previous employer training (β = .029, p = .794) and previous external training (β = -.019, p = .614) did not significantly predict KNWL scores on the post-test. The effect of the intervention on KNWL scores was not moderated by previous employer training or previous external training.

ITT with LOCF Imputation

HABS

The overall regression was not statistically significant (R^2 = .006, $F(3,620)$ = .327, p = .327). It was found that condition (β = .031, p = .442), previous employer training (β = .011, p = .278) and previous external training (β = .067, p = .094) did not significantly predict HABS scores on the post-test.

KNWL

The overall regression was statistically significant (R^2 = .163, $F(3,620)$ = 5.607, p < .001). It was found that condition (β = -.107, p = .007) and previous external training (β = -.112, p =

.005) significantly predicted KNWL scores on the post-test. Previous employer training (β = -.051, *p* = .195) did not significantly predict KNWL scores on the post-test. The effect of the intervention on KNWL scores was moderated by previous external training, but not by previous employer training.

Per Protocol

HABS

The overall regression was not statistically significant (R^2 = .014, *F*(3,458) = 2.184, *p* = .089). It was found that condition significantly predicted HABS scores on the post-test (β = .101, *p* = .030). Previous employer training (β = -.034, *p* = .464) and previous external training (β = .051, *p* = .277) did not significantly predict HABS scores on the post-test. The effect of the intervention on HABS scores was not moderated by previous employer training or previous external training.

KNWL

The overall regression was statistically significant (R^2 = .123, *F*(3,458) = 21.494, *p* < .001). It was found that condition significantly predicted KNWL scores on the post-test (β = -.347, *p* < .001). Previous employer training (β = .032, *p* = .463) and previous external training (β = -.043, *p* = .323) did not significantly predict KNWL scores on the post-test. The effect of the intervention on KNWL scores was not moderated by previous employer training or previous external training.

Exploratory Research Questions

RQ4-7: Are the effects moderated by age, gender, religiosity, and connection to the LGBTQ+ community?

To answer these questions, we present multiple regression analyses for both primary outcome measures. Condition, age, gender identity, religiosity, and connection to the LGBTQ+ community will be predictor variables. Results will be reported in the following order: 1) ITT with mean imputation, 2) ITT with LOCF imputation, and 3) Per protocol.

ITT with Mean Imputation

HABS

The overall regression was statistically significant (R^2 = .021., *F*(5,618) = 2.672, *p* = .021). It was found that condition significantly predicted HABS scores on the post-test (β = .123, *p* = .002). Age (β = .067, *p* = .097), gender identity (β = -.030, *p* = .461), religiosity (β = -.023, *p* =

.569), and connection to the LGBTQ+ community (β = -.038 *p* = .337) did not significantly predict HABS scores on the post-test. The effect of the intervention on HABS scores was not moderated by age, gender identity, religiosity, or connection to the LGBTQ+ community.

KNWL

The overall regression was statistically significant (R^2 = .165., *F*(5,618) = 24.426, *p* < .001). It was found that condition significantly predicted KNWL scores on the post-test (β = -.406, *p* < .001). Age (β = -.050, *p* = .186), gender identity (β = -.013, *p* = .724), religiosity (β = .029, *p* = .429), and connection to the LGBTQ+ community (β = -.034, *p* = .357) did not significantly predict KNWL scores on the post-test. The effect of the intervention on KNWL scores was not moderated by age, gender identity, religiosity, or connection to the LGBTQ+ community.

ITT with LOCF Imputation

HABS

The overall regression was not statistically significant (R^2 = .007., *F*(5,618) = .879, *p* = .495). It was found that condition (β = .035, *p* = .388), age (β = .021, *p* = .611), gender identity (β = -.044, *p* = .279), religiosity (β = .061, *p* = .136), and connection to the LGBTQ+ community (β = -.010 *p* = .806) did not significantly predict HABS scores on the post-test.

KNWL

The overall regression was marginally statistically significant (R^2 = .016, *F*(5,618) = 2.031, *p* = .073). It was found that condition significantly predicted KNWL scores on the post-test (β = .112, *p* = .006). Age (β = .003, *p* = .940), gender identity (β = .014, *p* = .343), religiosity (β = -.026, *p* = .528), and connection to the LGBTQ+ community (β = -.062 *p* = .124) did not significantly predict KNWL scores on the post-test. The effect of the intervention on KNWL scores was not moderated by age, gender identity, religiosity, or connection to the LGBTQ+ community.

Per Protocol

HABS

The overall regression was not statistically significant (R^2 = .019, *F*(5,456) = 1.740, *p* = .124). It was found that condition significantly predicted HABS scores on the post-test (β = .105, *p* = .026). Age (β = .077, *p* = .105), gender identity (β = -.035, *p* = .456), religiosity (β = -.023, *p* = .629), and connection to the LGBTQ+ community (β = -.045 *p* = .337) did not significantly predict HABS scores on the post-test. The effect of the intervention on HABS scores was not moderated by age, gender identity, religiosity, or connection to the LGBTQ+ community.

KNWL

The overall regression was marginally statistically significant (R^2 = .126, $F(5,456)$ = 13.205, p < .001). It was found that condition significantly predicted KNWL scores on the post-test (β = -.355, p < .001). Age (β = -.060, p = .184), gender identity (β = -.017, p = .699), religiosity (β = .039, p = .388), and connection to the LGBTQ+ community (β = -.041 p = .354) did not significantly predict KNWL scores on the post-test. The effect of the intervention on KNWL scores was not moderated by age, gender identity, religiosity, or connection to the LGBTQ+ community.

Table 9F, p, and R2 values of the primary regression analyses for the different analysis and imputation approaches

		F	*p*	R^2
ITT				
	Mean imputation			
	HABS	9.185	.003	.015
	KNWL	119.189	<.001	.161
	LOCF			
	HABS	.570	.451	.001
	KNWL	7.138	.008	.011
Per Protocol				
	HABS	4.720	.030	.010
	KNWL	62.910	<.001	.120

Subgroup analyses

For the following analyses, we used the ITT data set where missing values were imputed using mean imputation. We explored whether the intervention was more effective for specific subgroups, including age, gender identity, connection to the LGBTQ+ community and sexual orientation. Following input from our advisory groups, we also included years of experience as an exploratory analysis. We corrected for multiple comparisons by using a Bonferonni correction. For the perceived LGBTQ+ knowledge measure, no subgroup differences were identified (See Appendix E). However, analyses for the HABS revealed several subgroup effects.

Years of experience

Group 1 = 0-10 years (N = 428)

Group 2 = 11-20 years (N = 131)

Group 3 = 21-30 years (N = 51)

HABS

A univariate ANOVA with condition as independent variable and HABS post-test score as dependent variable revealed a significant main effect of Condition only for Group 1, $F(1, 426) = 6.226$, $p = .013$, $\eta_p^2 = .014$. For children's social workers with 0-10 years of experience, participants in the intervention condition ($M = 35.15$) had a lower score on the HABS post-test than participants in the control condition *(*$M = 37.13$*).*

KWNL

A univariate ANOVA with condition as independent variable and KNWL post-test score as dependent variable revealed a significant main effect of Condition for all groups. Group 1, $F(1, 426) = 84.493$, $p < .001$, $\eta_p^2 = .166$, Group 2, $F(1, 129) = 13.850$, $p < .001$, $\eta_p^2 = .097$, and Group 3, $F(1, 49) = 19.863$, $p < .001$, $\eta_p^2 = .288$. For children's social workers of all levels of experience, participants in the intervention condition had a higher score on the KNWL post-test than participants in the control condition*.*

Sexual orientation

Group 0 = Prefer not to say/Don't know (N = 21)

Group 1 = LGBTQ+ (N = 127)

Group 2 = Straight (N = 476)

HABS

A univariate ANOVA with condition as independent variable and HABS post-test score as dependent variable revealed a significant main effect of Condition only for Group 2, $F(1, 474) = 10.667$, $p = .001$, $\eta_p^2 = .022$. For children's social workers who identify as straight, participants in the intervention condition ($M = 35.83$) had a lower score on the HABS post-test than participants in the control condition *(*$M = 38.26$*).* For children's social workers who identify as LGBTQ+, there was no significant difference between the intervention condition ($M = 35.79$) and the control condition ($M = 35.93$).

KWNL

A univariate ANOVA with condition as independent variable and KNWL post-test score as dependent variable revealed a significant main effect of Condition for Group 1, $F(1, 125) = 30.181$, $p < .001$, $\eta_p^2 = .194$, and Group 2, $F(1, 474) = 86.967$, $p < .001$, $\eta_p^2 = .155$. Regardless of sexual orientation, all participants in the intervention group had a higher score on the KNWL post-test than participants in the control condition.

Gender id

- Group 1 = Woman (N = 537)

- Group 2 = Man (N = 78)

Other groups too small to include.

HABS

A univariate ANOVA with condition as independent variable and HABS post-test score as dependent variable revealed a significant main effect of Condition only for Group 1, $F(1, 535) = 8.379$, $p = .004$, $\eta_p^2 = .015$. For children's social workers who identify as a woman, participants in the intervention condition ($M = 35.73$) had a lower score on the HABS post-test than participants in the control condition *(*$M = 37.86$*).*

KWNL

A univariate ANOVA with condition as independent variable and KNWL post-test score as dependent variable revealed a significant main effect of Condition for Group 1, $F(1, 535) = 93.582$, $p < .001$, $\eta_p^2 = .149$, and Group 2, $F(1, 76) = 19.692$, $p < .001$, $\eta_p^2 = .206$. For both participants identifying as a woman, and those who identify as a man, all participants in the intervention group had a higher score on the KNWL post-test than participants in the control condition.

LGBTQ+ connection

Group 1 = Yes (N = 496)

Group 2 = N (N = 124)

HABS

A univariate ANOVA with condition as independent variable and HABS post-test score as dependent variable revealed a significant main effect of Condition only for Group 1, $F(1, 494) = 9.277$, $p = .002$, $\eta_p^2 = .018$. For children's social workers who have a connection to the LGBTQ+ community, participants in the intervention condition ($M = 35.73$) had a lower score on the HABS post-test than participants in the control condition *(*$M = 38.04$*).*

KWNL

A univariate ANOVA with condition as independent variable and KNWL post-test score as dependent variable revealed a significant main effect of Condition for Group 1, $F(1, 494) = 89.251$, $p < .001$, $\eta_p^2 = .153$, and Group 2, $F(1, 122) = 29.624$, $p < .001$, $\eta_p^2 = .195$. Whether they had a connection to the LGBTQ+ community or not, all participants in the intervention group had a higher score on the KNWL post-test than participants in the control condition.

Age

- Group 1 = 20-35 yeas old (N = 231)
- Group 2 = 36-50 years old (N = 262)
- Group 3 = 50+ years old (N = 131)

HABS

A univariate ANOVA with condition as independent variable and HABS post-test score as dependent variable revealed a significant main effect of Condition for Group 2, $F(1, 260) = 7.074$, $p = .008$, $\eta_p^2 = .026$. For children's social workers who are 36-50 years old, participants in the intervention condition ($M = 35.66$) had a lower score on the HABS post-test than participants in the control condition ($M = 38.29$). There was also a significant main effect of Condition for Group 3, $F(1, 129) = 7.157$, $p = .008$, $\eta_p^2 = .053$. For children's social workers who are over 50 years old, participants in the intervention condition ($M = 35.38$) had a lower score on the HABS post-test than participants in the control condition ($M = 39.52$). For children's social workers who are 20-35 years old, there was no significant difference between the intervention condition ($M = 36.03$) and the control condition ($M = 36.48$).

KWNL

A univariate ANOVA with condition as independent variable and KNWL post-test score as dependent variable revealed a significant main effect of Condition for all groups. Group 1, $F(1, 229) = 34.817$, $p < .001$, $\eta_p^2 = .132$, Group 2, $F(1, 260) = 60.556$, $p < .001$, $\eta_p^2 = .189$, and Group 3, $F(1, 129) = 27.553$, $p < .001$, $\eta_p^2 = .176$. For children's social workers of all ages, participants in the intervention condition had a higher score on the KNWL post-test than participants in the control condition.

Implementation and Process Evaluation

In the post-test survey, participants (N = 188) in the intervention condition were asked several questions about the process of undergoing the e-learning training module. Both quantitative and qualitative data were collected. A full list of example IPE survey items questions are available in the study protocol (Schaub et al., 2022c); however, to reduce participant survey burden, we limited the inclusion to the most pertinent (and discussed the inclusion of these with both advisory groups). The use of a census style IPE provided a robust set of responses, with almost a complete data set from the intervention group. Only 3 of 10 questions had less than complete responses, the lowest being 'did you experience any difficulties understanding the material, but even this attracted a 97.3% response rate. Few

participants noted any challenges with accessing the training (>10%), and the vast bulk of then found enrolling on the training very easy or easy (95.74%).

Participants were positive about the e-learning training module. More than 90% of participants reported being 'very satisfied' or 'satisfied' with each of the four training module units and, also found it easy to enrol on the course. After completing the course 99.5% of participants thought they are now better able to support LGBTQ+ young people. Qualitative data from free text answers to the IPE survey showed improved skills and confidence about working with LGBTQ+ young people, and an improved ability to evaluate their practice with this group. Participants cited the value of tailored resources; research and case study guidance; practical recommendations/strategies to address SOGIE-related challenges; and reminders of their legal and professional responsibilities as per the *Equality Act 2010*.

Appendix F includes graphs to depict the distribution of responses to the IPE questions. We also provide a table with the means and variances of responses in the intervention condition.

Fidelity and adaptation

RQ: Was the training undertaken as expected?

The average time it took for participants to complete the e-learning module was 3 hours 25 minutes, which aligns with what the provider (Stonewall) suggested would be expected (between two to four hours).

Acceptability

RQ: is the content of the training consistent with participants' own experiences and values?

How easy was it to enrol in the course? This question was answered on a 5-point Likert scale ranging from 'very easy' to 'very difficult'. The majority of participants found it 'very easy' to enrol in the course (71.26%), followed by 'easy' (24.47%) (with 95.73% noting either 'very easy' or 'easy'), and 'neither easy nor difficult' (4.26%). None of the participants opted for 'difficult' or 'very difficult', indicating that overall, participants had an easy experience enrolling in the course.

Did you experience any difficulties with the materials? This question has two answer options: yes and no. The large majority of participants (90.16%) answered no to this question, indicating that more than 90% of respondents had no difficulties with the materials in most instances.

A further survey question related to this RQ was: **How satisfied were you with each unit of the course?** There were four units in the course, and for each of the units, participants answered on a 5-point Likert scale ranging from very dissatisfied to very satisfied. The average scores for the units ranged from 4.34 to 4.40, indicating high satisfaction for each unit.

Programme differentiation

RQ: what does existing LGBTQ+ diversity training delivery for social workers look like in participating authorities?

We addressed this research question with the survey question: Have you undertaken any substantial training on LGBTQ+ related issues since the inception of the study? This question was offered to participants in the control condition. Answer options includes yes and no. Only 5.84% of participants (N = 15) answered 'yes'.

We followed this up with a further question: **What was the format of the LGBTQ+ training provided?** This question was a follow-up question to the previous question and was answered by all participants who answered 'yes'.

There were four answer options:

In-person or online workshop (62.50%)
e-module (12.50%)
external educational resources (18.75%)
other (6.25%)

These data demonstrate that the majority of participants that undertook training received either in-person or online workshop training.

Mechanism

RQ (a): Does implementing the intervention lead to perceived changes in the interim and ultimate outcomes identified in the ToC?

We addressed this research question with the survey question: *Was the course detailed enough for your needs as a social worker working with young people, some of whom are LGBTQ?* This question was answered on a 5-point Likert scale ranging from 'not detailed at all' to 'extremely detailed'. The average answer was 4.01, indicating that the course was perceived to be 'very detailed'. The response option 'extremely detailed' was selected by 22.87% of participants and 'very detailed' was selected by 59.04%.

A further question for this RQ was: *Thinking specifically about gender identity, how detailed did you find the course for your needs a social worker working with transgender and/or non-binary young people?* This question was answered on a 5-point Likert scale ranging from 'not detailed at all' to 'extremely detailed'. The average answer was 3.90, indicating that the course was perceived to be 'very detailed'. The response option 'extremely detailed' was selected by 18.09% of participants and 'very detailed' was selected by 60.11%.

RQ (b): To what extent to participants feel able to translate skills learned during the intervention into practice?

We addressed this research question with the survey question: *Do you think you are better able to support LGBTQ+ young people after completing the training?*

Answer options to this question include yes and no. The large majority of participants (99.47%) answered yes to this question, indicating that the training helped participants feel better able to support LGBTQ+ young people.

RQ (c): Is the level of effectiveness of the intervention perceived to differ for different groups?

The analysis to this research question is presented earlier in the Findings section, notably the exploratory subgroup analysis section.

RQ (d): Are there any perceived unintended or negative consequences as a result of introducing the intervention?

Do you think there were any areas that needed greater explanation? When asked if there were any areas that needed greater explanation, 15.7% answered 'yes'. Qualitative analyses of free text answers to the IPE survey indicated a greater need for attention to the social work context (e.g., in terms of Ofsted inspection criteria, local authority requirements for social care etc.), and more information specific to the unique needs of transgender and gender diverse young people or those with an asexual or pansexual identity. Additionally, social workers wanted two further content areas: working with families of origin about challenges accepting SOGIE, and what supports would be effective in improving the poor mental health of LGBTQ+ young people in care. In the qualitative free text responses, participants did not note any unintended or negative consequences.

Cost Evaluation

In this section, we provide a financial analysis detailing the costs to local authorities implementing the intervention per recipient. These include:

- Stonewall intervention delivery costs: £42 per participant (VAT included) (304 participants x £42= £12,768)

- Time of staff/participants:
    - Length of undertaking the intervention: approximately 3.5 hours
    - Time undertaking pre and post-test: approximately 30 min
    - Four hours per participant x (n=304) = 1,216 total hours
    - 1,216 hours @ £46 per hour = £55,936 total cost to employers
- Costing outline as per Unit Costs of Health and Social Care programme (Curtis & Burns, 2020):
    - Children's social worker average pay scale of £34,982 per year in the United Kingdom
    - Working time 41.4 weeks per year, 37 hours per week
    - Estimated average pay for social worker £46 per hour

No other recurring costs for local authorities were found in the delivery of the intervention.

DISCUSSION

Discussion of Findings

This study was the first RCT testing the effectiveness of an LGBTQ+ knowledge e-learning training module for children's social workers, both in the UK and internationally. We evaluated the impact of the training on LGBTQ+ knowledge and heteronormative attitudes and beliefs compared to a control group experiencing 'business as usual'. We included age, gender identity, religiosity, connection to the LGBTQ+ community and previous training as exploratory covariates.

Our findings provided initial evidence that the e-learning training module is effective at increasing LGBTQ+ knowledge and reducing heteronormative attitudes and beliefs for children's social workers (with some limitations, which can be found below). We examined the effectiveness using several analysis approaches and found evidence that the training intervention could be effective for most approaches. There was only one exception; for the intention-to-treat (ITT) analyses in which Last Observation Carried Forward (LOCF) was used as missing data imputation methods, we did not find a significant effect of condition on the HABS scale, measuring heteronormative attitudes and beliefs. This is not surprising, as the LOCF imputation method assumes that for all participants with missing outcome data there was no change between pre- and post-test, potentially underestimating the actual treatment effect. In comparison, the mean imputation method did show an effect of condition on heteronormative attitudes and beliefs, although it might be argued that this method potentially overestimates a treatment effect by assuming that the programme would have been equally effective for non-compliers. Nevertheless, the literature suggests that the mean imputation method is not uncommon in social work research (Saunders et al., 2006). Furthermore, this was the only exception in terms of treatment effects found. In sum, we consider this initial evidence for the effectiveness of the programme on influencing heteronormative attitudes and beliefs in the wider social work population.

For the perceived LGBTQ+ knowledge, all analyses yielded significance, indicating evidence that the training was effective at improving children's social workers LGBTQ+ knowledge. It is notable that our findings are consistently positive across the domains tested in our RQs. While the strengths of the effects vary (a little) across the questions they all indicate that this training is potentially effective in helping LGBTQ+ children in care which in combination provide greater confidence in the results as demonstrated in many aggregative approaches

(Montgomery et al, 2019). This was the first trial on this scale to test the effectiveness of an e-learning training for LGBTQ+ knowledge, and the preliminary evidence can be used as a foundation for future studies with fewer missing data points.

In addition to finding evidence for a treatment effect, the implementation and process evaluation suggested that participants were very positive about training access and content. Most importantly for this study and the population under inspection, participants felt confident that their LGBTQ+ knowledge increased because of the training. Whilst this study did not examine the link between the training and whether this affected social workers' practice, this finding is an important first step in supporting LGBTQ+ youth.

Although the change in both knowledge and attitudes was significant for all but one analysis, the effects were larger for knowledge increase. This discrepancy seems intuitive, as the main theory of change of the training was to increase participant's knowledge on LGBTQ+ young people and their support needs. An increase in knowledge by learning facts and concepts, might be easier to achieve than a change in attitudes, which would involve forming new or different viewpoints, often has an emotional factor attached to it, and might require contact with individuals belonging to the marginalised group (Hutchinson et al., 2014; Steck & Perry, 2017). Alternatively, the difference in effect size may be attributed to the difference in scales used. The scale for perceived LGBTQ+ knowledge included five answer options, whereas the HABS scale provided seven answer options. Indeed, the number of response options on a Likert scale has been thought to affect response style (Weijters et al., 2010).

With respect to the secondary and exploratory research questions involving covariate analyses, we found little evidence for significant covariates. Only in the ITT analysis with LOCF imputation, we found that previous external training on LGBTQ+ issues predicted the outcome on the perceived LGBTQ+ knowledge measure. Overall, these findings suggest that the included moderators are not strong predictors of intervention success, which suggests that the intervention may work similarly for different participant groups. Future studies with larger sample sizes could further investigate this to strengthen these conclusions.

Exploratory subgroup analyses only revealed differences on the HABS measure and suggested that the training might be more effective in reducing heteronormative attitudes and beliefs for certain groups than others. More specifically, stronger effects on heteronormative attitudes and beliefs were found for children's social workers who: 1) have

0-10 years of experience, 2) identify as straight, 3) identify as a woman, 4) have a connection to the LGBTQ+ community, or 5) are over 35 years old. However, these findings should be interpreted with caution, as the subgroups were unequal in size and some subgroups were potentially too small to reach sufficient power. A lack of an effect in some of the subgroups can be explained by further exploring the pre-test scores. For example, we did not find an effect of condition on the HABS post-test scores for those who identify as LGBTQ+, which can perhaps be attributed to the assumption that LGBTQ+ participants are more likely to have fewer heteronormative attitudes and beliefs to start with regardless of condition.

Overall, our analyses provide promising initial evidence for the effectiveness the e-learning training module, particularly to improve LGBTQ+ knowledge. We opted for the use of several analysis approaches and missing data imputation methods to compare results across analysis methods. We found effects for all analysis and imputation methods except one (attitudes as measured by HABS when tested by LOCF). Our findings echo consistent calls within the literature for training about SOGIE and experiences of LGBTQ+ young people in care (Kaasbøll et al., 2021; McCormick et al., 2017; Schaub et al., 2022). This study supports and expands previous research related to training for helping professions and demonstrates the effectiveness of e-learning training in improving the knowledge and attitudes of social workers about LGBTQ+ young people with a brief, cost-effective, and accessible but comprehensive intervention. This knowledge is important as it shows that relevant training for this group is effective, highly accessible and relatively cost-effective, which can be implemented to provide sector-wide changes in knowledge, confidence and attitudes towards LGBTQ+ young people, arguably among the most marginalised of any group of young people supported by social care. In addition to social work, these findings are also relevant to other helping or public sector professions.

A notable strength of this study is that this is the first of its kind within the UK social work context succeeding in the recruitment of a large sample of children's social workers. Rigorous RCTs remain scarce in social care and social work research (Moody et al., 2020). Co-production techniques were another strength, with the trial involving a range of stakeholders, including social care professionals and a group of LGBTQ+ young people (16 to 24) with lived experience of social care. A further strength is that participants were social workers currently in practice rather than students, who have more typically been the target audience of much previous research likely because of the easier recruitment and retention for this group (Bettergarcia et al., 2021).

Our recruitment provided another substantial strength – the sample is representative of the English social worker population. In September 2021, there were 32,500 full-time children and family social workers in England (GOV.UK, 2022), so our sample represents approximately 2% of the total population of children's social workers in England. The gender representation of the sample corresponds with the English national children's social work workforce, with the sample predominantly identifying as female (~86%), and the wider workforce similarly (87%; GOV.UK, 2022). This representation also aligns with the international workforce, for example the USA, where 84.4% of the workforce identified as female (Data USA, 2020). 17.4% of our participants were from ethnic minority backgrounds, which is slightly lower than the proportion in the national workforce (23%; GOV.UK, 2022). Not only was our sample representative, but we recruited a pre-test sample size sufficient for our initial power calculations, especially considering recruitment challenges reported in previous research (Acquivita et al., 2009; Canda, Nakashima & Furman, 2004) and the lack of research capacity in social workers (Harvey et al., 2013; Wakefield et al., 2022).

LIMITATIONS

As with any research, the present study includes some limitations. First, the sample was self-selecting, which may have led to an overrepresentation of certain groups. Recruiting self-selecting participants can have multiple, conflicting effects, as some people may participate who want the intervention to be successful, and other people may participate who wish the intervention to be unsuccessful. These various groups may have contradictory influences on the outcome, which further studies may choose to investigate. Equally, it is possible that the intervention would have more potential to affect the beliefs or knowledge of participants who are less enthusiastic about the intervention as they may be starting from a lower baseline of these measures. We had a greater representation of LGBTQ+ people than is found in the general population, suggesting a greater interest from this population. This could have implications for the wider roll-out of the training. It is important to establish whether similar effects are found in a population for whom the training is mandatory in order to more reliably generalise the results. However, we did find evidence suggesting that the training was similarly effective for participants who had and did not have a connection to the LGBTQ+ community, suggesting that levels of connection did not impact on the intervention effectiveness. As a second limitation, this trial found evidence for the effectiveness of the training in improving LGBTQ+ knowledge, but it was outside the scope of this trial to examine whether this translates to improved practice. This should be examined in a future study, potentially following up with participants from this trial, to better understand the impact on practice. It is notable, however, that participants noted in the IPE survey that they felt better able to support LGBTQ+ young people following completion of the intervention, which would support the benefit of this training for practice.

With regards to our methods, firstly, it could be noted that the time between the pre- and the post-test was not equal across the sample. However, as this was a pragmatic RCT, allowing us to test the effectiveness of the intervention under real-world conditions, this would likely be a similar range of engagement across those enrolled on the training. Whilst this is arguably a limitation to the best of our knowledge no significant secular events occurred during this phase. Secondly, we experienced differential attrition rates across conditions, which could potentially bias the results. It is therefore important to view these findings as initial evidence for the effectiveness of the training that should be further solidified in future trials. Thirdly, to assess perceived LGBTQ+ knowledge, we constructed our own scale. Although it was adapted from an existing scale (Gandy-Guedes, 2018) with excellent internal reliability ($\alpha = .94$), our scale was not validated. The decision for a shorter, unvalidated

measure was made to reduce burden on participants. In similar research, LGBTQ+ knowledge gains among helping professionals are typically assessed using non-standardised measures designed by researchers specifically for their training programs that employ multiple-choice, Likert-scale or true-false formats, according to a systematic review (Morris et al., 2019). Lastly, we had to use a modified ITT approach, as we were not able to administer post-tests to those who had not (fully) completed the training. This does provide a limitation given the need to impute missing data based on known sample characteristics (as per our protocol and advisory group discussions). We have attempted to outline the different possibilities according to the imputation strategies and results for each. However it should be noted that only one outcome (LOCF for HABS) from all the analyses did not show significant effects and we believe that our results, taken as a whole, provide initial evidence for the effectiveness of the training. Future research should address this limitation by designing the trial in such a way that post-tests are offered to all who were randomised to substantiate conclusions.

CONCLUSION AND RECOMMENDATIONS

This study provides initial evidence that the Stonewall e-learning training module *Supporting LGBTQ+ Children and Young People* is effective at increasing perceived LGBTQ+ knowledge and decreasing heteronormative stereotypes in children's social workers in England. The knowledge generated by this study offers an important foundation for the development of an effective social workforce that can support all young people, including LGBTQ+ young people. Future research should test the longitudinal replication of these results. Furthermore, future studies should focus on optimising the training to make it optimally suitable for children's social workers. The training was originally developed for professionals working with children and young people's more broadly, but minimally adapted by the researchers to make it suitable for social workers. These adjustments were made through discussion with the advisory group, and adjustments were made to make the training more specific to social care (such as changing a case scenario based in a school to a group home placement). This could be developed further – in particular what is needed is to assess how training paired with coaching or supervision can support improvements in practice.

This study's findings recommend training as an essential first step in creating social care workforce with the requisite knowledge to work with LGBTQ+ young people and challenging dominant (and negative) cis-heteronormative views in care settings. Given the substantial interlinking of skills and knowledge from social workers to the rest of the wider care workforce, it would seem reasonable to assume the findings could be helpfully considered more broadly to other practitioners in the sector; one group is practitioners working in residential care homes, as this group often struggle to access knowledge and skills training, and may lack the relevant qualifications or experience for residential practice (Steels & Simpson, 2017). The issues for care home workers are particularly concerning because LGBTQ+ young people are significantly more likely to be placed in restrictive care than non-LGBTQ+ youth, and experience widespread discrimination in these settings (Schaub et al., 2022a, 2022b). A recent systematic review found that LGBTQ+ educational/training materials for British health and social care professionals are readily available from relevant providers but, irrespective of this availability, that LGBTQ+ people continue to experience discrimination or direct prejudice from these services/providers (Hunt et al., 2019). We therefore recommend SOGIE-focused training for all social workers. Previous studies linked

to this trial suggest a need for social work training to include a particular focus on transgender or gender diverse young people and LGBTQ+ young people from racial or ethnic minority backgrounds (Erney & Weber, 2018; Schaub et al., 2022a). Furthermore, policy makers might note the effectiveness of this trial and consider implementing this training within pre-qualifying courses.

Our previously published scoping review and qualitative study findings (Schaub et al., 2022a, b), combined with the findings from this trial, suggest it would be helpful to consider a system-wide approach including the adoption of clear and enforceable anti-discrimination policies and strategies for developing/providing appropriate services specific/tailored to LGBTQ+ youth. Care systems must make practice and policy improvements to develop a system in which: A) LGBTQ+ young people will be protected and supported, and B) that care providers will be held accountable for SOGIE-related discrimination. Altogether, these changes will demonstrate care environments commitment to providing culturally responsive care to LGBTQ+ young people and ensure staff who could benefit from such training are not able to opt out. Training can support the development of policies specifically addressing LGBTQ+ inclusive practice.

Recommendations for Future Research

This study offers an important building block for future research and provides novel evidence of the effectiveness of the e-learning training module to increase perceived LGBTQ+ knowledge and decrease heteronormative attitudes and beliefs in children's social workers. Our findings provide several directions for future research. Firstly, future studies should address the longitudinal effect of the training by administering follow-up measures at several intervals after the post-test has taken place to test effect durability; it is important to understand whether the effects are short-lived or have a lasting impact to support cost-effectiveness of provision. Secondly, data could be collected on the impact of the training on social workers' practice. An action research project, using a combined interviews and observation method would illuminate changes made to practice as a result of the training and provide robust understanding of how social workers are applying the knowledge in their practice. Thirdly, future studies could explore how the training could be optimised for children's social workers. Participants requested more social work-specific content, which should be co-produced with sector stakeholders in future work. Fourthly, in following studies, it could be explored how effects of this training extend to other health, care and educational professions to address gaps knowledge about LGBTQ+ young in all these environments.

Finally, we strongly advocate for the increased use of RCTs in social work and social care research, which can add to the range of methods and types of knowledge used to create and develop services. Given the challenges for supporting social work engagement with experimental trials such as this one, greater support by councils for social workers to participate in these types of studies are encouraged to produce high-quality data connected to the field. Although methodological adaptions might be required, this study demonstrates this approach is feasible and contribute to a robust evidence base.

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APPENDICES

Appendix A: CONSORT-SPI checklist

Section	CONSORT Abstract item	Relevant CONSORT-SPI item	Where included
Title	Identification of the study as randomised		Title page
Authors	Contact details for the corresponding author		Title page
Trial design	Description of the trial design (e.g. parallel, cluster, noninferiority)	If the unit of random assignment is not the individual, refer to CONSORT for Cluster Randomised Trials and report the items included in its extension for abstracts [8]	Methods section > research design

Section	CONSORT Abstract item	Relevant CONSORT-SPI item	Where included
Methods			
Participants	Eligibility criteria for participants and the settings where the data were collected	When applicable, eligibility criteria for the setting of intervention delivery and the eligibility criteria for the persons who delivered the interventions	Methods > sample recruitment and selection criteria
Interventions	Interventions intended for each group		Methods > conditions
Objective	Specific objective or hypothesis	If pre-specified, how the intervention was hypothesised to work	Introduction > the intervention
Outcomes	Clearly defined primary outcome for this report		Methods > data collection > measures

Section	CONSORT Abstract item	Relevant CONSORT-SPI item	Where included
Randomisation	How participants were allocated to interventions		Methods > randomisation
Awareness of assignment	Who was aware of intervention assignment after allocation (for example, participants, providers, those assessing outcomes), and how any masking was done		Methods > randomisation
Results			

Section	CONSORT Abstract item	Relevant CONSORT-SPI item	Where included
Number randomly assigned	Number randomised to each group		Findings > participant flow
Recruitment	Trial status		Methods > sample recruitment and selection criteria
Interventions		Extent to which interventions were actually delivered by providers and taken up by participants as planned	Findings > participant flow
Number analysed	Number analysed in each group		Findings > participant flow Figure 1
Outcomes	For the primary outcome, a result for each group and the estimated effect size and its precision		Findings

Section	CONSORT Abstract item	Relevant CONSORT-SPI item	Where included
Harms	Important adverse events or side effects		NA
Conclusions	General interpretation of the results		Discussion > discussion of findings
Trial registration	Registration number and name of trial register		Methods > protocol registration and ethical review
Funding	Source of funding		Title pages > funding and competing interests

Appendix B: Measures

The Heteronormative Attitudes and Beliefs (HABS) Scale (Habarth, 2015)

Instructions:

Below are some statements representing different attitudes and beliefs. You will probably find that you agree with some of the statements, and disagree with others, to varying extents. Please indicate your reaction to each statement by circling the appropriate phrase beneath each statement.

1. In healthy intimate relationships, women may sometimes take on stereotypical 'male' roles, and men may sometimes take on stereotypical 'female' roles. (R)
2. In intimate relationships, women and men take on roles according to gender for a reason; it's really the best way to have a successful relationship.
3. *There are only two sexes: male and female.*
4. People should partner with whomever they choose, regardless of sex or gender. (R)
5. *Gender is the same thing as sex.*
6. *Femininity and masculinity are determined by biological factors, such as genes and hormones, before birth.*
7. *All people are either male or female.*
8. Things go better in intimate relationships if people act according to what is traditionally expected of their gender.
9. *Gender is a complicated issue, and it doesn't always match up with biological sex. (R)*
10. It's perfectly okay for people to have intimate relationships with people of the same sex. (R)

11. *People who say that there are only two legitimate genders are mistaken.* (R)
12. *Gender is something we learn from society. (R)*
13. There are particular ways that men should act and particular ways that women should act in relationships.
14. The best way to raise a child is to have a mother and a father raise the child together.
15. *Sex is complex; in fact, there might even be more than 2 sexes. (R)*
16. Women and men need not fall into stereotypical gender roles when in an intimate relationship. (R)

Response Options Below Each Item:

strongly disagree	disagree	slightly disagree	exactly neutral	slightly agree	strongly agree

Item Order:

The order in the list above is one possible random ordering of scale items.

Scoring:

Essential Sex and Gender subscale items are in italicized font; Normative Behavior subscale items are in regular font.

Mean scores are calculated for each subscale based on values from 1-7 assigned to possible response options. Items followed by (R) should be reverse-scored before calculating mean scores.

Perceived LGBTQ+ Knowledge Scale

Activities (core component of training programme)	Survey Items
Language, stereotypes and assumptions	01: I feel knowledgeable about terms and stereotypes relating to LGBTQ+ young people's identities. *
Challenging inappropriate behaviour	02: I know how to respond when I hear service users or co-workers use derogatory language or insinuations about LGBTQ+ people.
Diversity within (e.g., subgroup differences, intersectionality)	03: It is important to be aware that LGBTQ+ young people have similar and shared experiences across the group.
Unconscious bias	04: Children under the age of 13 are too young to know whether they are LGBTQ+ or not. *
Formal action planning, advocacy and signposting	05: I know how to connect an LGBTQ+ young person to relevant LGBTQ+ resources in the community. *

*Denotes an adapted survey item from queer youth cultural competency (QYCC) scale (Gandy-Guedes, 2018).

This 5-item measure was adapted according to the core components of the intervention (see ToC diagram; Schaub et al., 2022c). This was done due to the limited time allotted for the survey and to measure increases in LGBTQ-specific knowledge. Items 1, 2 and 5 are scored on a Likert-type scale from 1 (strongly disagree) to 5 (strongly agree) and items 3 and 4 are reverse scored from 1 (strongly agree) to 5 (strongly disagree), yielding a maximum possible score of 25. Higher scores indicate greater knowledge about the LGBTQ+ community.

The Centrality of Religiosity Scale (CRSi-7) (Huber & Huber, 2012)

Dimension	No	Items
Intellect	1	How often do you think about religious issues?
Ideology	2	To what extend do you believe that God, deities or something divine exits?
Public practice	3	How often do you take part in religious services?
Private practice	4	How often do you pray?
	4a	How often do you meditate?
Experience	5	How often do you experience situations in which you have the feeling that God or something divine allows for an intervention in your life?
	5b	How often do you experience situations in which you have the feeling that you are in "one with all"?

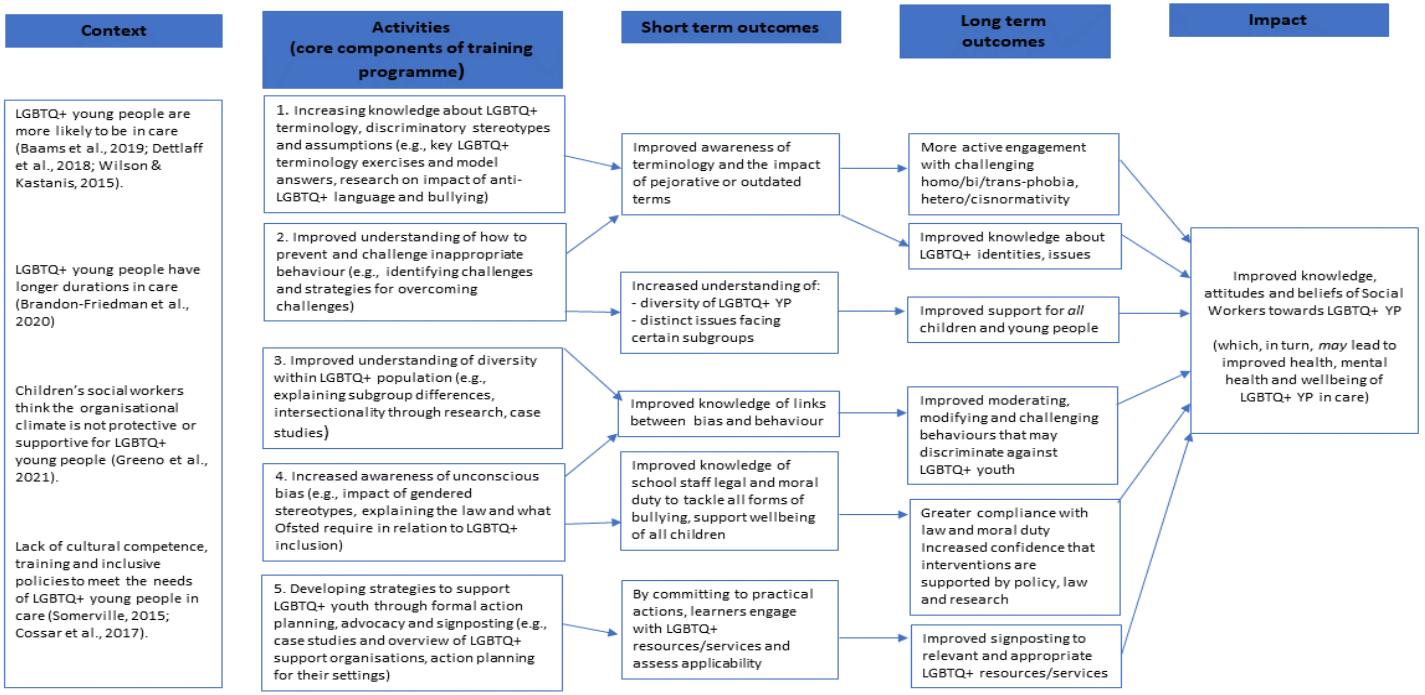
Response options for all items except item 2

Very often	Often	Occasionally	Rarely	Rarely

Response options for item 2

Very much so	Quite a bit	Moderately	Not very much	Not at all

Appendix C: Theory of Change



Enablers

- Engagement with – and display of - LGBTQ+ resources, services and materials (e.g., posters, rainbow lanyards, greater incorporation of LGBTQ+ issues in curriculum etc.)
- Ongoing coaching to put new knowledge into practice
- Clear policies on the expectations that school staff will challenge homo/bi/trans-phobic language and bullying, formal challenges for reporting homo/bi/trans-phobic behaviour

Appendix D: Additional Tables

Table 4. *Participant Gender Identity by Condition.*

	Percentage	
	Intervention	Control
Woman	85.9	86.3
Man	12.5	12.5
Transwoman	-	-
Transman	-	-
Non-binary/genderqueer/agender	1.0	.6
Don't know	-	-
Prefer not to say	.6	-
Other	-	.6

(Variance Intervention Condition = .472, Variance Control Condition = .504)

Table 5. *Participant Sexual Orientation by Condition.*

	Percentage	
	Intervention	Control
Bisexual	10.3	6.4
Gay	4.8	4.8
Lesbian	4.2	4.8
Straight	75.9	76.7
Queer	1.9	3.2
Prefer not to say	2.6	3.2
Other	.3	1.0

(Variance Intervention Condition = 1.181, Variance Control Condition = 1.019)

Table 6. *Participant Ethnicity by Condition.*

	Percentage	
	Intervention	Control

White	82.6	85.3
Mixed/multiple	5.8	5.8
Asian/British Asian	4.2	3.2
Black/African/Caribbean/Black British	6.4	4.5
Other	.6	1.3
Missing	.3	-

(Variance Intervention Condition = .782, Variance Control Condition = .700)

Table 7. *Participant Religion by Condition.*

	Percentage	
	Intervention	Control
No religion	58.8	61.3
Christian	33.4	29.1
Buddhist	.3	1.0
Muslim	2.6	1.9
Hindu	1.0	-
Jewish	.3	1.3
Sikh	.6	1.9
Other	2.9	3.5

(Variance Intervention Condition = 1.960, Variance Control Condition = 2.614)

Table 8. *Participant Age and Years of Experience by Condition.*

		M	Minimum	Maximum	Variance
Age	Intervention	41.18	22	69	56.260
	Control	39.27	22	66	107.565
Years of experience	Intervention	8.98	0	38	65.330
	Control	8.91	0	46	105.886

Appendix E: Split Group Analyses for the LGBTQ+ Knowledge Measure

For the perceived LGBTQ+ knowledge measure, no subgroup differences were identified

Output split by years of experience

A univariate ANOVA with condition as independent variable and perceived LGBTQ+ knowledge as dependent variable found no subgroup differences. For all groups, there was a significant main effect of condition.

Group 1 = 0-10 years of experience (N = 428) : $F(1, 426) = 84.493$, $p < .001$

Group 2 = 11-20 years of experience (N = 131) : $F(1, 129) = 13.850$, $p < .001$

Group 1 = 0-10 years of experience (N = 51) : $F(1, 49) = 19.863$, $p < .001$

Output split by sexual orientation

A univariate ANOVA with condition as independent variable and perceived LGBTQ+ knowledge as dependent variable found no subgroup differences. For all groups, there was a significant main effect of condition.

Group 1 = LGBTQ+ (N = 127) : $F(1, 125) = 30.181$, $p < .001$

Group 2 = Straight (N = 476) : $F(1, 474) = 86.967$, $p < .001$

Output split by gender identity

A univariate ANOVA with condition as independent variable and perceived LGBTQ+ knowledge as dependent variable found no subgroup differences. For all groups, there was a significant main effect of condition.

Group 1 = Woman (N = 537) : $F(1, 535) = 93.582$, $p < .001$

Group 2 = Man (N = 78) : $F(1, 76) = 19.692$, $p < .001$

Output split by LGBTQ+ connection

A univariate ANOVA with condition as independent variable and perceived LGBTQ+ knowledge as dependent variable found no subgroup differences. For all groups, there was a significant main effect of condition.

Group 1 = Yes (N = 496) : $F(1, 494) = 89.251$, $p < .001$

Group 2 = No (N = 124) : $F(1, 122) = 29.624$, $p < .001$

Output split by age

A univariate ANOVA with condition as independent variable and perceived LGBTQ+ knowledge as dependent variable found no subgroup differences. For all groups, there was a significant main effect of condition.

Group 1 = 20-35 years old (N = 231) : $F(1, 229) = 34.817$, $p < .001$

Group 2 = 36-50 years old (N = 262) : $F(1, 260) = 60.556$, $p < .001$

Group 3 = 50+ years old (N = 131) : $F(1, 129) = 27.553$, $p < .001$

Appendix F: Regression Analysis Tables

RQ1 *How effective is the training course in changing social workers' heteronormative and cisnormative attitudes and beliefs about LGBTQ+ young people?*

Table. Regression Table Mean Imputation

	B	SE	β	t	Sig.
(Constant)	33.675	1.064		31.662	<.001
Condition	2.037	.672	.121	3.031	.003

Notes. R = .121, p = .003

Dependent variable: HABS post score

Table. Regression Table LOCF

	B	SE	β	t	Sig.
(Constant)	36.956	1.299		28.456	<.001
Condition	.619	.821	.030	.755	.451

Notes. R = .030

Dependent variable: HABS post score

Table. Regression Table Per Protocol

	B	SE	β	t	Sig.
(Constant)	33.718	1.531		22.022	<.001
Condition	1.995	.918	.101	2.173	.030

Notes. R = .101

Dependent variable: HABS post score

RQ2 *How effective is the training course in changing social workers' perceived knowledge about LGBTQ+ young people?*

Table. Regression Table Mean Imputation

	B	SE	β	t	Sig.
(Constant)	26.424	.336		78.700	.000
Condition	-2.316	.212	-.401	-10.917	<.001

Notes. R = .401

Dependent variable: KNWL post score

Table. Regression Table LOCF

	B	SE	β	t	Sig.
(Constant)	23.239	.458		50.753	<.001
Condition	-.773	.289	-.107	-2.672	.008

Notes. R = .107

Dependent variable: KNWL post score

Table. Regression Table Per Protocol

	B	SE	β	t	Sig.
(Constant)	26.421	.486		54.313	<.001
Condition	-2.314	.292	-.347	-7.932	<.001

Notes. R = .347

Dependent variable: KWNL post score

RQ3 *Are the effects moderated by previous employer and external LGBTQ+ knowledge training?*

Table. Regression Table Mean Imputation

	B	SE	β	t	Sig.
(Constant)	33.718	2.094		16.102	<.001
Condition	2.045	.673	.121	3.040	.002
Employer training	-.521	.692	-.030	-.753	.452
External training	.446	.796	.022	.560	.576

Notes. R = .126

Dependent variable: HABS post score

Table. Regression Table Mean Imputation

	B	SE	β	t	Sig.
(Constant)	26.371	.661		39.893	<.001
Condition	-2.319	.212	-.401	-10.919	<.001
Employer training	.173	.219	.029	.794	.428
External training	-.127	.251	-.019	-.504	.614

Notes. R = .402

Dependent variable: KNWL post score

Table. Regression Table LOCF

	B	SE	β	t	Sig.
(Constant)	33.679	2.553		13.193	<.001
Condition	.630	.820	.031	.769	.442
Employer training	.235	.844	.011	.278	.781
External training	1.629	.971	.067	1.678	.094

Notes. R = .075

Dependent variable: HABS post score

Table. Regression Table LOCF

	B	SE	β	t	Sig.
(Constant)	25.562	.895		28.553	<.001
Condition	-.777	.288	-.107	-2.703	.007
Employer training	-.384	.296	-.051	-1.297	.195
External training	-.959	.340	-.112	-2.816	.005

Notes. R = .163

Dependent variable: KNWL post score

Table. Regression Table Per Protocol

	B	SE	β	t	Sig.
(Constant)	32.806	2.969		11.050	<.001
Condition	1.996	.919	.101	2.172	.030
Employer training	-.689	.939	-.034	-.733	.464
External training	1.155	1.062	.051	1.087	.277

Notes. R = .119

Dependent variable: HABS post score

Table. Regression Table Per Protocol

	B	SE	β	t	Sig.
(Constant)	26.651	.943		28.247	<.001
Condition	-2.314	.292	-.347	-7.924	<.001
Employer training	.219	.298	.032	.735	.463
External training	-.334	.338	-.043	-.990	.323

Notes. R = .351

Dependent variable: KNWL post score

RQ4-7 *Are the effects moderated by age, gender, religiosity, and connection to the LGBTQ+ community?*

Table. Regression Table Mean Imputation

	B	SE	β	t	Sig.
(Constant)	33.307	2.237		14.887	<.001
Condition	2.070	.677	.123	3.057	.002
Age	.055	.033	.067	1.661	.097
Gender	-.358	.484	-.030	-.738	.461
Religiosity	-.232	.407	-.023	-.569	.569

LGBTQ+ Connection	-.764	.796	-.038	-.960	.337

Notes. R = .145

Dependent variable: HABS post score

Table. Regression Table Mean Imputation

	B	SE	β	t	Sig.
(Constant)	27.136	.707		38.388	<.001
Condition	-2.346	.214	-.406	-10.967	<.001
Age	-.014	.010	-.050	-1.323	.186
Gender	-.054	.153	-.013	-.354	.724
Religiosity	.102	.128	.029	.791	.429
LGBTQ+ Connection	-.232	.252	-.034	-.921	.357

Notes. R = .406

Dependent variable: KNWL post score

Table. Regression Table LOCF

	B	SE	β	t	Sig.
(Constant)	35.337	2.733		12.931	<.001
Condition	.714	.827	.035	.863	.388
Age	.021	.040	.021	.508	.611
Gender	-.641	.592	-.044	-1.083	.279
Religiosity	.742	.497	.061	1.494	.136
LGBTQ+ Connection	-.239	.972	-.010	-.246	.806

Notes. R = .084

Dependent variable: HABS post score

Table. Regression Table LOCF

	B	SE	β	t	Sig.
(Constant)	24.065	.964		24.962	<.001

Condition	-.813	.292	-.112	-2.785	.006
Age	.001	.014	.003	.075	.940
Gender	.072	.209	.014	.343	.732
Religiosity	-.111	.175	-.026	-.632	.528
LGBTQ+ Connection	-.528	.343	-.062	-1.538	.124

Notes. R = .127

Dependent variable: KNWL post score

Table. Regression Table Per Protocol

	B	SE	β	t	Sig.
(Constant)	33.189	3.079		10.778	<.001
Condition	2.075	.929	.105	2.234	.026
Age	.072	.045	.077	1.624	.105
Gender	-.522	.700	-.035	-.745	.456
Religiosity	-.271	.560	-.023	-.483	.629
LGBTQ+ Connection	-1.036	1.079	-.045	-.961	.337

Notes. R = .137

Dependent variable: HABS post score

Table. Regression Table Per Protocol

	B	SE	β	t	Sig.
(Constant)	27.402	.979		27.986	<.001
Condition	-2.368	.295	-.355	-8.020	<.001
Age	-.019	.014	-.060	-1.332	.184
Gender	-.086	.223	-.017	-.387	.699
Religiosity	.154	.178	.039	.865	.388
LGBTQ+ Connection	-.318	.343	-.041	-.927	.354

Notes. R = .356

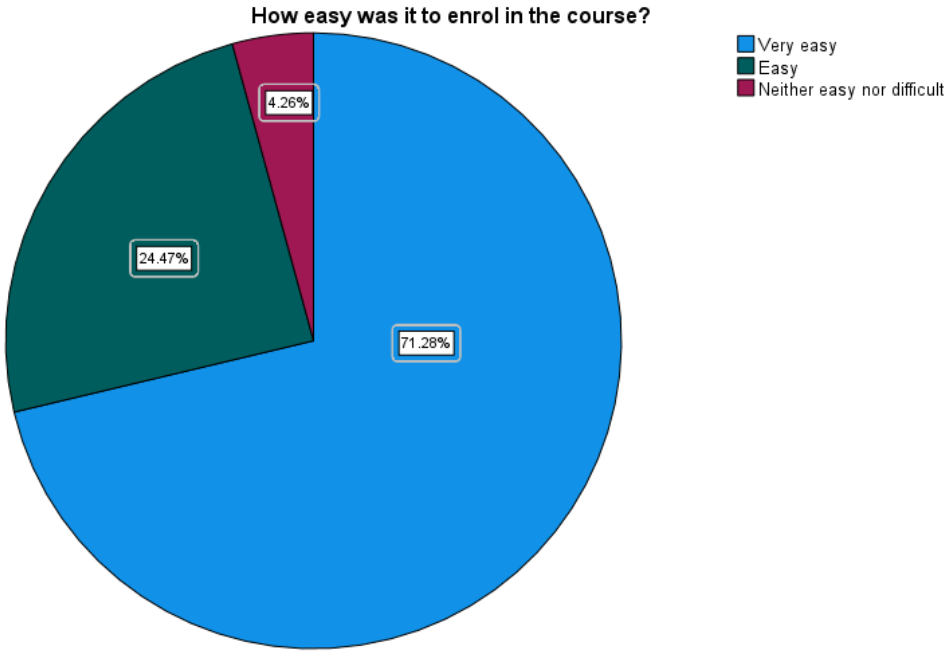
Dependent variable: KNWL post score

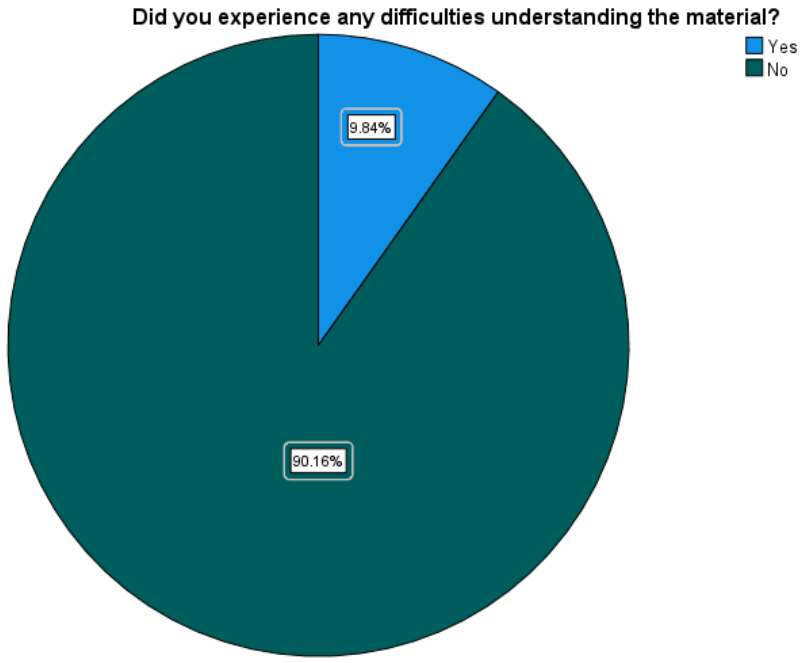
Appendix G: Implementation and Process Evaluation

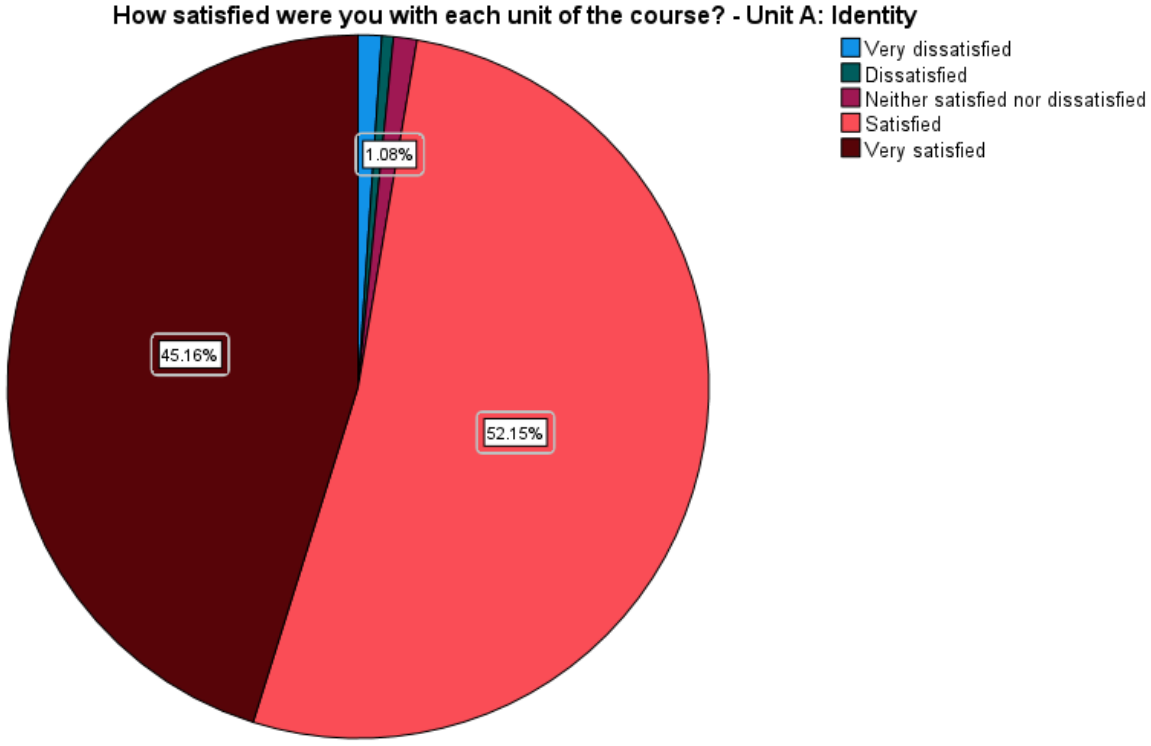
Below, we present a set of pie charts that display the distribution of answers to the quantitative questions on the implementation and process evaluation survey for the intervention group.

Acceptability:

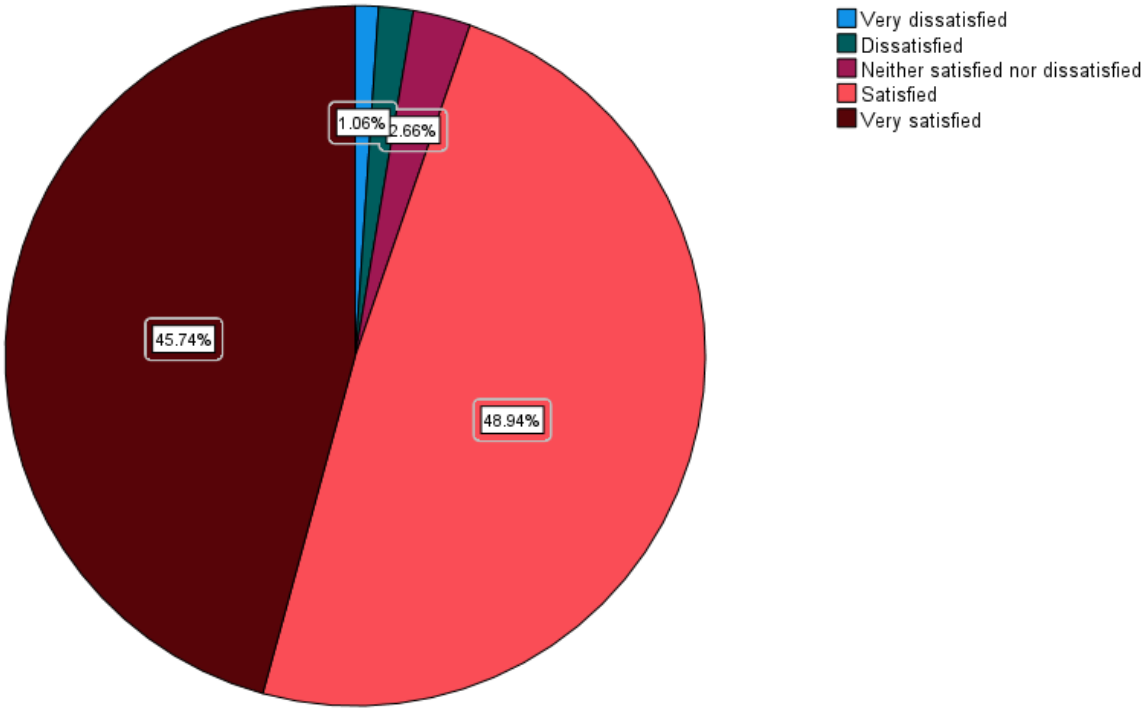
Is the content of the training consistent with the participants' own experiences and values?



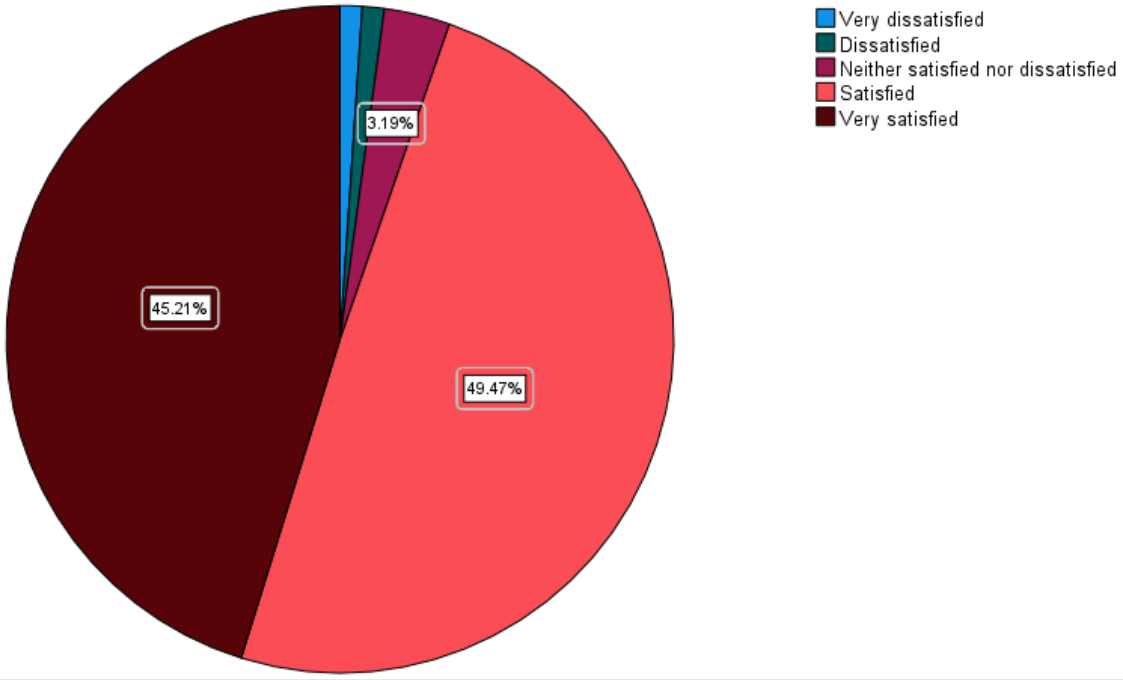

Did you experience any difficulties understanding the material?
Yes
No
9.84%
90.16%

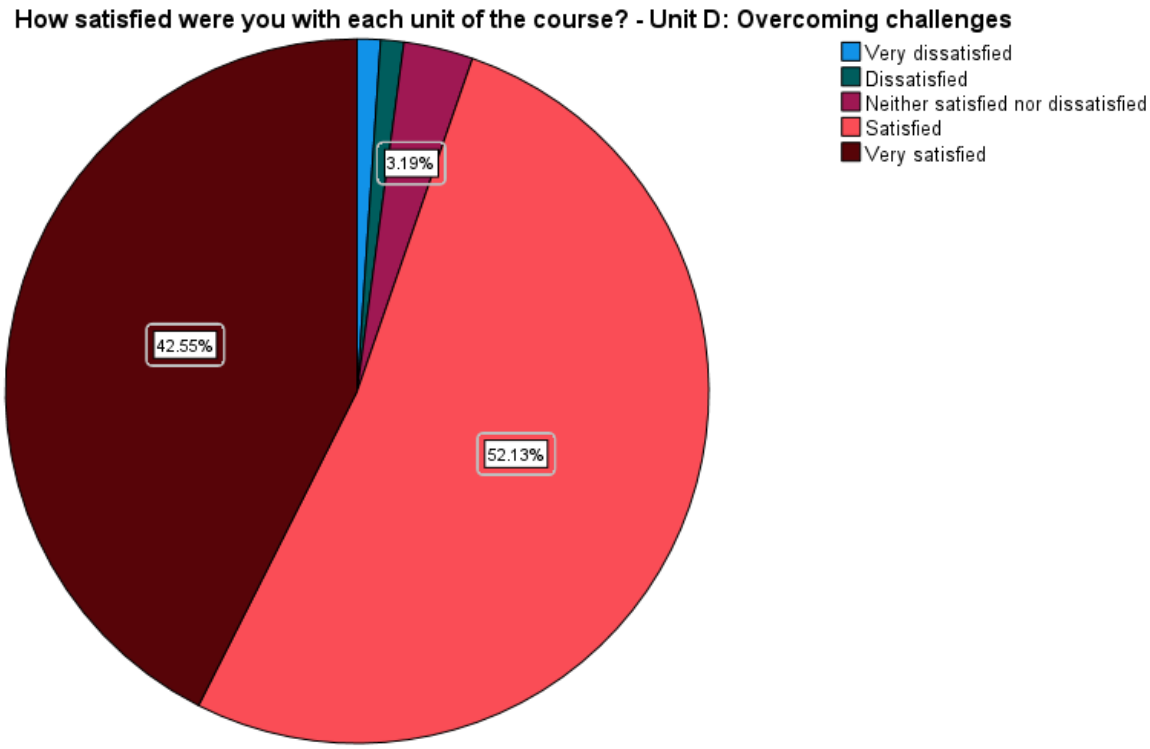

How satisfied were you with each unit of the course? - Unit A: Identity
Very dissatisfied
Dissatisfied
Neither satisfied nor dissatisfied
Satisfied
Very satisfied
1.08%
45.16%
52.15%

How satisfied were you with each unit of the course? - Unit B: Statistics, the law and regulatory bodies



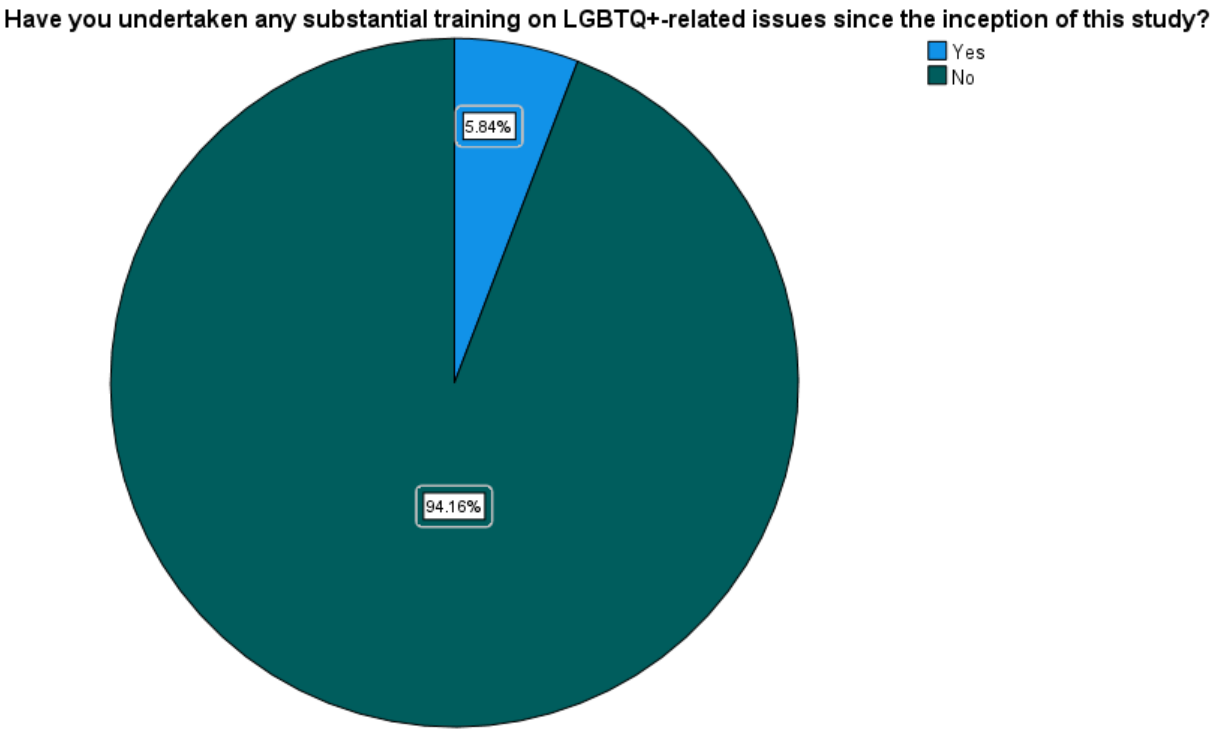
How satisfied were you with each unit of the course? - Unit C: Challenging bullying and supporting LGBTQ+ children and young people



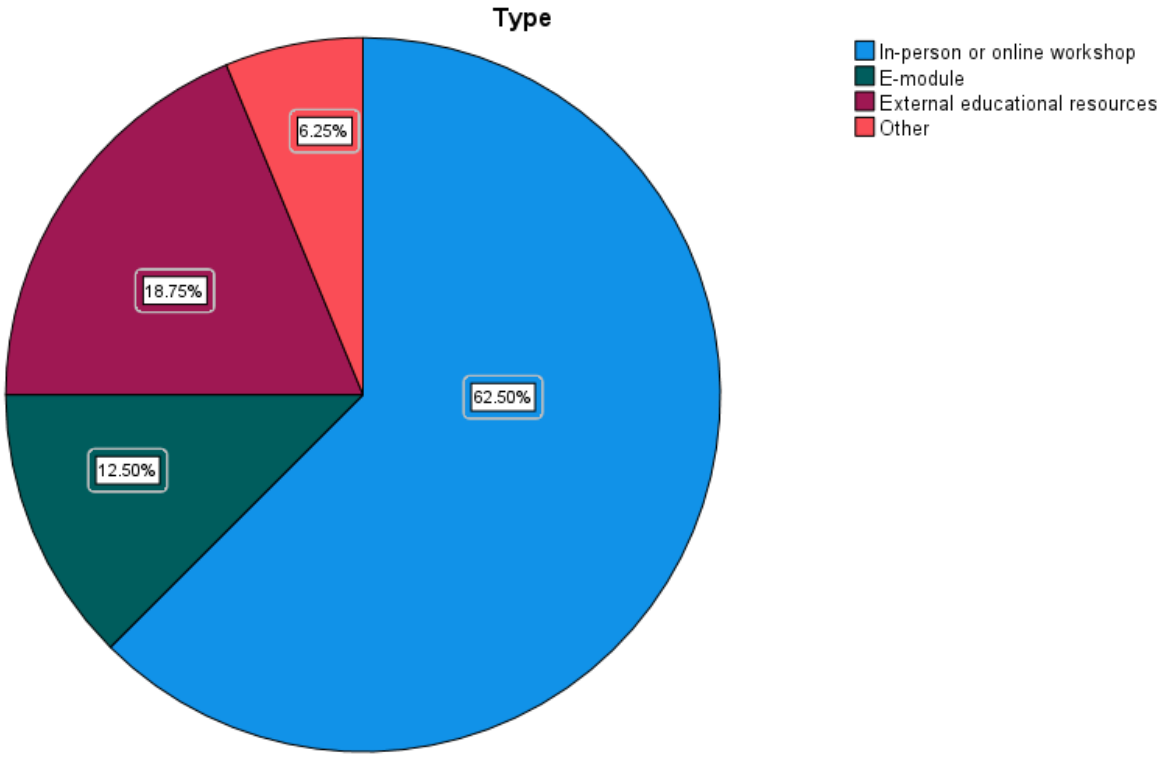


Programme Differentiation:

What does existing LGBTQ+ diversity training delivery for social workers look like in participating authorities?

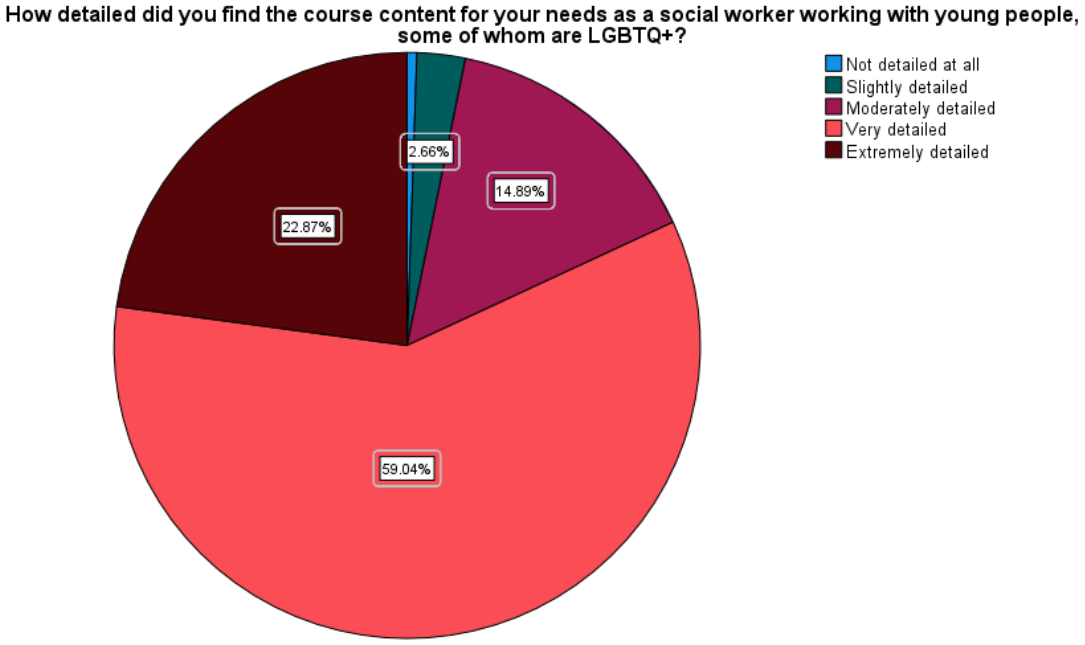


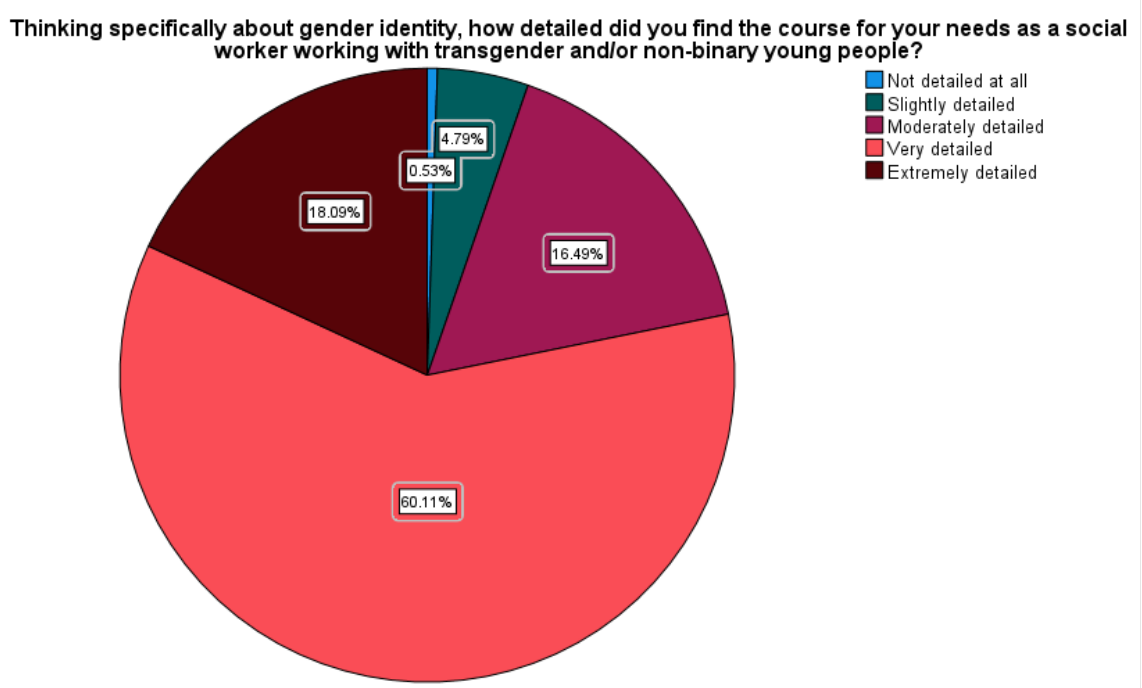
For the people who answered yes (N=15), the graph below displays the type of training they had undertaken.



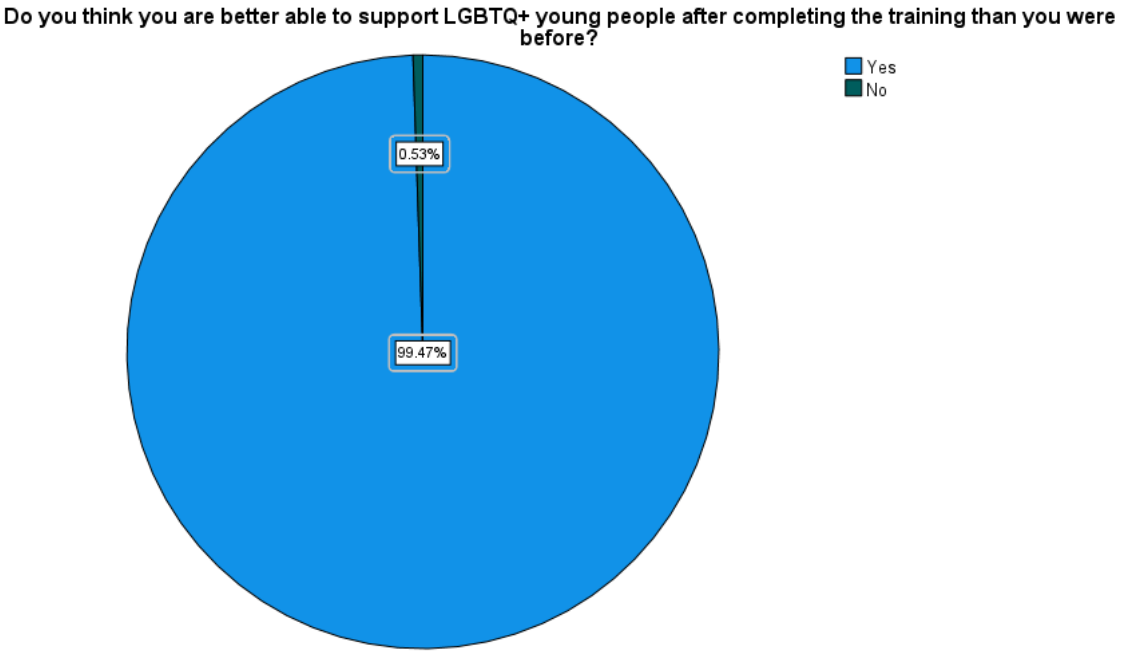
Mechanism:

a. ***Does implementing the intervention lead to perceived changes in the interim and ultimate outcomes identified in the Theory of Change (ToC)?***





b. To *what extent do participants feel able to support LGBTQ+ young people after completing the training?*



e. Are there any perceived unintended or negative consequences as a result of the intervention?

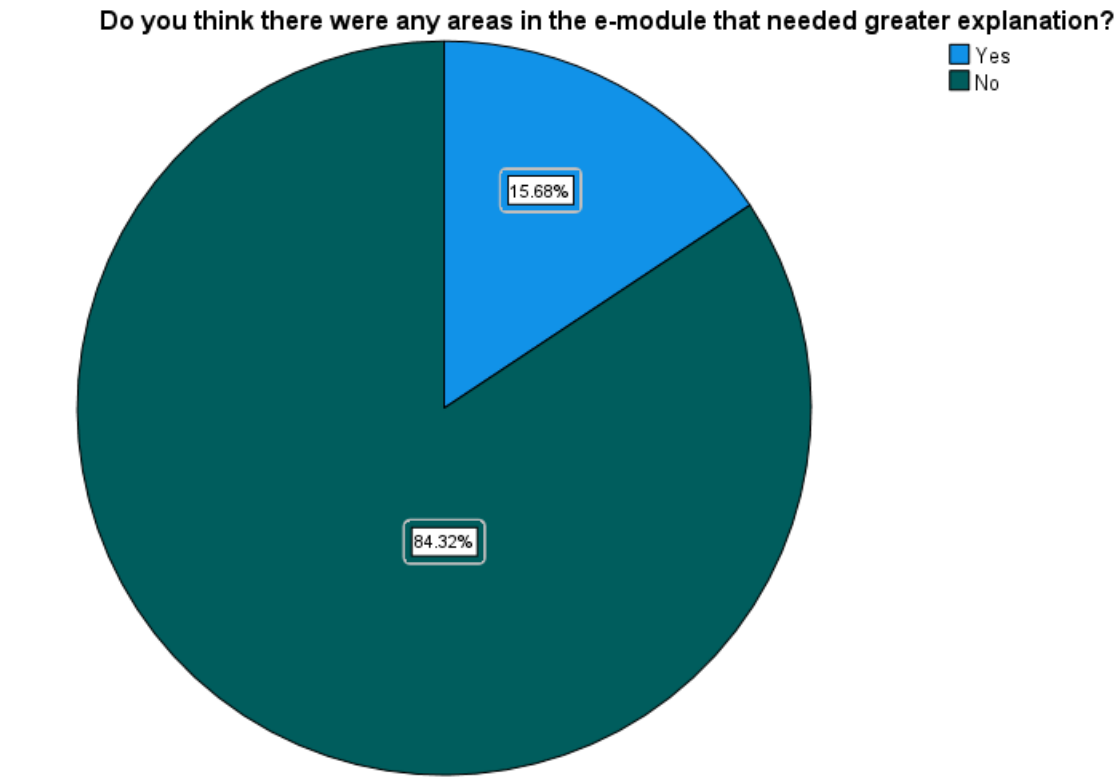

Do you think there were any areas in the e-module that needed greater explanation?
Yes
No
15.68%
84.32%

Table. N, Means, SDs and Variances of the quantitative data of the implementation and process evaluation survey

	1. How easy was it to enrol in the course?	2. Did you experience any difficulties understanding the material?	3. How detailed did you find the course content for your needs as a social worker working with young people, some of whom are LGBTQ+	4. Thinking specifically about gender identity, how detailed did you find the course for your needs a social worker working with transgender and/or non-binary young people?	5. How satisfied were you with each unit of the course? Unit A: Identity	6. How satisfied were you with each unit of the course? Unit B: Statistics, the law and regulatory bodies	7. How satisfied were you with each unit of the course? Unit C: Challenging bullying and supporting LGBTQ+ children and young people	8. How satisfied were you with each unit of the course? Unit D: Overcoming challenges	9. Do you think you are better able to support LGBTQ+ young people after completing the training than you were before?	10. Do you think there were any areas in the e-module that needed greater explanation?
N	188	183	188	188	186	188	188	188	188	185
Mean	1.33	1.90	4.01	3.90	4.40	4.37	4.37	4.34	1.01	4.84

SD	.555	.299	.731	.761	.652	.715	.700	.695	.073	.365
Variance	.308	.089	.535	.579	.425	.512	.490	.482	.005	.133

1. 1 = Very easy, 5 = Very difficult
2. 1 = Yes, 2 = No
3. 1 = Not detailed at all, 5 = Extremely detailed
4. 1 = Not detailed at all, 5 = Extremely detailed
5. 1 = Very dissatisfied, 5 = Very satisfied
6. 1 = Very dissatisfied, 5 = Very satisfied
7. 1 = Very dissatisfied, 5 = Very satisfied
8. 1 = Very dissatisfied, 5 = Very satisfied
9. 1 = Yes, 2 = No
10. 4 = Yes, 5 = No

In the post-test, the control were asked about any training they had undertaken in the time period of the study. The charts below demonstrate the responses.

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