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## How do LGBT+ young people utilize the internet in relation to their mental health and envisage the use of e-therapy? An exploratory study

**Background:** Lesbian, gay, bisexual, and transgender youth and other young people diverse in terms of their sexuality and gender (LGBT+) are at an elevated risk of mental health problems, such as depression. Factors such as isolation and stigma mean that accessing mental health services can be particularly challenging for LGBT+ young people, and previous studies have highlighted that many prefer to access psychological support online. Research from New Zealand has demonstrated promising effectiveness and acceptability for an LGBT+ focused serious game-based computerized cognitive behavioral therapy program, Rainbow SPARX (Smart, Positive, Active, Realistic, X-factor thoughts). However, there has been limited other research conducted in the area of e-therapy for LGBT+ people.

**Objectives:** We aimed to explore how and why LGBT+ young people use the internet to support their mental health. We also sought to explore LGBT+ young people's and professionals' views about e-therapies, drawing upon the example of Rainbow SPARX.

**Methods:** Three focus groups and five semi-structured interviews were conducted with 21 LGBT+ young people (aged 15 to 22 years old) and six professionals (four health and social care practitioners and two National Health Service commissioners) in England and Wales. A general inductive approach was used to analyze data.

**Results:** LGBT+ youth participants considered that use of the internet was ubiquitous and that it was valuable for support and information. However, they also thought that internet use could be problematic, and they highlighted certain internet safety and personal security considerations. They drew on a range of gaming experiences and expectations to inform their feedback about Rainbow SPARX. Their responses focused on the need for this e-therapy program to be updated and refined. LGBT+ young people experienced challenges related to stigma and mistreatment, and they suggested that strategies addressing their common challenges should be included in e-therapy content. Professional study participants also emphasized the need to update and refine Rainbow SPARX. Moreover, professionals highlighted some of the issues associated with e-therapies needing to demonstrate effectiveness, and the challenges associated with health service commissioning processes.

**Conclusions:** LGBT+ young people use the internet to obtain support and access information, including information related to their mental health. They are interested in LGBT+ specific e-therapies, however these must be in a contemporary format, engaging, and adequately acknowledge the experiences of LGBT+ young people.

**Keywords:** Sexuality; LGBT; Transgender; Depression; Adolescent; Psychotherapy; Mental Health; Computer Games; Computerized CBT; e-Therapy.

## Introduction

### The mental health of LGBT+ young people

Lesbian, gay, bisexual (LGB), and transgender young people and other sexuality and gender diverse youth (LGBT+) are thought to form up to 12% of the adolescent population [1,2]. Recent systematic reviews have indicated that LGBT+ young people are more likely to experience mental health problems, such as depression, self-harm and suicidality than their age-matched peers [1,3]. For instance, in a meta-analysis of population-based studies, LGB and other sexuality diverse youth were almost three times more likely to have depressive symptoms or a depressive disorder in comparison to heterosexual youth [1]. These greater mental health risks are hypothesized to be caused by minority stress, whereby it is mistreatment and high levels of stress that places LGBT+ young people at greater risk [4,5]. In particular, experiencing mistreatment and stress results in LGBT+ individuals frequently internalizing the negativity associated with anti-LGBT+ messages. This in turn can lead to self-loathing and a range of unhelpful cognitions, which are then thought to place LGBT+ young people at greater risk of mental health problems, such as depression [6]. Moreover, it is not unusual for LGBT+ young people to face the challenge of navigating multiple stigmas related to difference, such as being LGBT+ and having mental health problems [7] or being an ethnic minority and LGBT+ [8]. In addition to being 'different' and having greater mental health needs, LGBT+ youth are frequently required to manage antagonistic environments in an on-going manner, whilst simultaneously struggling with a general lack of social support [7]. Given these challenges, it would be logical to assume that there has been a strong focus on providing psychotherapeutic supports for LGBT+ young people. Unfortunately to date this has not been the case. Research in the area of psychotherapeutic interventions for this unique population is limited and LGBT+ young people report difficulties accessing face-to-face professional help for their emotional concerns [9].

### LGBT+ young people and the internet

The internet has opened up a range of possibilities for LGBT+ young people, including psychosocial support and self-care for mental health problems. This assistance may be especially pertinent for LGBT+ young people, where parental support, a crucial protective factor in adolescence, may be lacking [10]. For example, LGBT+ young people can readily connect with others online, irrespective of where they reside, and as such the internet has become an important source of support, information, and connection [11,12]. LGBT+ young people can also obtain informal help online to assist them in managing LGBT+ specific mistreatment (such as homophobia) and in coping with emotional distress [7].

To date, little has been published on how LGBT+ young people use the internet to successfully support their mental health. However, research from Canada and the United States has highlighted that LGBT+ young people are particularly active

internet users [13], and use a wide range of online media for information, resources and support [13,14]. Work from Australia has also highlighted the relative importance of social media for LGBT+ young people, especially for transgender young people [15]. For example, 75% of transgender young people in Strauss and colleagues' study (n=711) reported that social media use was the most common online activity participants engaged in to help them feel better [15]. In England, McDermott and colleagues have conducted a Department of Health commissioned mixed-methods study focused on suicidality, self-harm and help-seeking in LGBT+ young people [16]. Most LGBT+ young people in their study reported a preference for accessing help through the internet, followed by face-to-face and then mobile (i.e. SMS/texting) forms of support [16]. Young people in their study had the most positive experiences when asking for help online, as well as from friends, or from LGBT+ youth groups. In contrast, primary care General Practitioners (GPs) and mental health services delivered by the National Health Service (NHS) received low ratings in terms of their perceived helpfulness by LGBT+ young people with mental health problems [16]. Whilst McDermott and colleagues found that LGBT+ young people value internet-based supports, little detail about the types of e-therapy or online help that could be provided were outlined. Instead they advocated for "...a more imaginative approach to providing support and help" (p. 170) for LGBT+ young people and they suggested that services be situated in non-clinical settings such as online [17].

### LGBT+ young people and e-therapy

Formal online mental health interventions have become far more accessible in the last decade. In particular in the form of computerized cognitive behavioral therapy (cCBT), which has become an effective and recommended form of e-therapy for the treatment of depression [18]. As an intervention cCBT is particularly promising for LGBT+ young people as it offers opportunities to increase access to treatment. This is because it does not necessarily require therapist support; it can be made freely available to end users; it can be completed in privacy; and, it can be made accessible to socially and geographically isolated individuals via the internet [6].

Although LGBT+ young people are an under-served population in terms of their mental health needs, few therapies, online [19] or offline, have been developed for them. A recent systematic review of psychosocial interventions for mental health problems amongst LGBT+ young people stated that only "A few promising psychological therapies adapted to meet the needs of LGBTQIA [Lesbian, Gay, Bisexual, Transgender, Queer, Intersex and Asexual] individuals have emerged in recent years" (p. 2) [10]. This review from Van Der Pol-Harney and McAloon [10] and another review, conducted by Hobaica and colleagues [20], identified only one computerized intervention to support the mental health of LGBT+ young people, which was not focused on addressing drug usage, specifically Rainbow SPARX (Smart, Positive, Active, Realistic, X-factor thoughts) [10,20]. This intervention is a seven module cCBT program created for sexual minority young people from New Zealand [21], and is delivered in the English language. Rainbow SPARX has been evaluated in an open trial with LGBT+ young people [21,22], but has not been

trialed nor appraised for use in the United Kingdom (UK), or anywhere other than New Zealand.

It is perhaps surprising that to date no e-therapies have been developed or tested for LGBT+ young people in the UK. This is particularly noteworthy given that LGBT+ young people have indicated a preference for online help, and that there is a strong policy push towards providing more e-therapies in the UK. For instance, one of the key recommendations when planning services from 2016-2021 from the Mental Health Taskforce to the NHS in England was that the NHS “...should expand work on NHS Choices [the main patient-facing website] to raise awareness and direct people to effective digital mental health products...” [23, p. 42]. Using e-therapies that have already been developed and tested elsewhere could enable health services in the UK to provide a range of effective treatment options, including for LGBT+ young people.

### The current study

This study sought to explore the acceptability of a non-UK developed intervention, Rainbow SPARX, for use in UK settings. At present Rainbow SPARX is the only e-therapy focused on addressing depression in LGBT+ youth. Rainbow SPARX is an adapted version of SPARX [21], which is a serious game and form of cCBT for the treatment of depressive symptoms. It uses the medium of a fantasy world, where the user's avatar is faced with a series of challenges to rid a virtual world of gloom and negativity [21,24]. SPARX uses computer graphics and interactive exercises to engage users. Each of the program's seven modules takes approximately 30 minutes to complete, and modules have a direct teaching component where the skills from the fantasy world are applied to real life [21]. A randomized controlled trial of SPARX was conducted in New Zealand in a general population of young people seeking help for their mental health issues [24]. Per-protocol analyses (n=143) showed that SPARX was not inferior to treatment-as-usual, and post-intervention results showed a mean reduction of depressive symptoms [24]. SPARX is now freely available online to anyone with a New Zealand Internet Protocol/IP address. Following feedback from LGBT+ young people about the importance of refining SPARX for this population, Rainbow SPARX (or SPARX: The Rainbow Version) was made in consultation with LGBT+ young people [6]. An open trial of Rainbow SPARX (n=21) was conducted with LGBT+ young people in New Zealand [21]. This preliminary research highlighted that Rainbow SPARX was a promising intervention in terms of effectiveness by showing a significant reduction of depressive symptoms. This research also showed that it was deemed by participants to be an acceptable form of therapy, and was judged to be feasible to deliver [21,22]. However, the cultural relevance of an e-therapy designed in New Zealand needs to be examined in terms of its suitability to young people in a different cultural context. This is because mental health interventions frequently need to be modified to best meet their users' needs across cultural contexts [25,26], and SPARX includes various Māori (i.e. indigenous New Zealand) and other South Pacific references. Furthermore, the acceptability of the program to professionals (including mental health practitioners) and commissioners is important to assess, as their views are

key to ensuring the funding and promotion of e-therapies is achieved within health services.

Building on prior mixed-methods research related to Rainbow SPARX [6,21,22,27], in the current study we had two key research objectives:

1. To explore how and why LGBT+ young people use the internet to support their mental health.
2. To consider the extent to which LGBT+ young people, their parents (or guardians), and professionals think an e-therapy, like Rainbow SPARX, could be a useful tool to assist in supporting the mental health of LGBT+ young people.

The consolidated criteria for reporting qualitative research (COREQ) [28] was used to guide reporting in this study.

## Methods

Ethical approval for this study was obtained from The Open University's Human Research Ethics Committee (reference HREC/2017/2507/Lucassen/1).

### Participants:

For inclusion in this study participants needed to be living in the UK and to be:

- An LGBT+ young person aged 12 to 22 years old;
- The parent or guardian of an LGBT+ young person; or,
- A professional with, either, expertise in working with LGBT+ young people or in adolescent mental health service provision/commissioning.

Young people who were exclusively heterosexual and cisgender (i.e. those who experience congruence between their gender identity and the sex they were assigned at birth) were not eligible to participate.

### Recruitment:

Recruitment of LGBT+ young people in research projects is often fraught with challenges and ethical issues [6,27]. For example, many LGBT+ young people are not 'out' to their parents, and for those under 16 years of age, written parental consent is almost always required if they wish to participate in mental health-related studies. In light of the challenges associated with conducting research in this field we took a pragmatic approach to recruitment in two key ways. Firstly, the age inclusion criteria for young people was initially set to be up to 19 years, but because there was considerable interest from LGBT+ young adults (who were already existing members of the youth groups involved in this study) the age range was extended. Hence participants in this study included young people who were existing members of an LGBT+ youth group. Secondly, one young person who was not a member of any LGBT+ youth groups, but was very keen to take part in the study, was offered an individual interview (with ML and RS present).

Potential participants who were LGBT+ young people and parents of LGBT+ young people were informed about the study via advertising on social media (e.g. on closed



Facebook groups for LGBT+ individuals and their allies) and from networks of LGBT+ organizations known to, or recommended to the authors. For instance, key LGBT+ youth organizations with a web presence in major UK cities were contacted in London, Cardiff, Manchester, Edinburgh and Belfast, and staff in these organizations were informed about this research. Primarily, young people heard about the study from staff supportive of this project at relevant LGBT+ youth groups. Potential participants who were professionals were known to the authors and were approached by either ML or LW.



Figure 1. Rainbow SPARX image

#### Procedures:

The interviews and focus groups were led by ML (a gay and queer male-identified academic experienced in youth mental health work) with assistance from fellow academics (i.e. RS and LW). Written parental and participant informed consent was obtained from those LGBT+ young people aged between 12 to 15 years old. Adult participants and LGBT+ young people aged 16 years or older provided written

consent for themselves. Each interview and focus group began with personal introductions (e.g. names and correct gender pronouns); confirmation of the research objectives and processes; ML also explained that he led the development of Rainbow SPARX; and ML highlighted his interest in supporting the mental health of LGBT+ young people. The semi-structured interview guide used in the focus groups and interviews were developed by the authors and reviewed by colleagues independent of this study. See Appendix 1 for the focus group guide (the focus group questions were adjusted for the interview format). The questions were open-ended (e.g. *“What are the main reasons why LGBT+ young people use the internet?”* and *“In what ways should Rainbow SPARX be adapted to meet the needs of LGBT+ young people in the United Kingdom?”*) and discussion was actively encouraged. During the interview or focus group participants were shown module 1 of Rainbow SPARX, with a single participant controlling the game at any one time, whilst others watched and commented. Participants did not need to have any prior knowledge of this program, serious gaming or e-therapy. Young people were offered a £20 gift voucher as a gratuity. Interviews and focus groups were digitally audio-recorded and professionally transcribed. The transcripts were thoroughly checked against the digital recordings by ML for accuracy before data analysis began.

Participants completed a brief demographics questionnaire at the end of the interview or focus group. Specifically, young people were asked questions which included open response items asking their age, gender/gender identity, and ethnicity. They were also asked about their sexuality (i.e. *“Please circle below which applies for you: Lesbian, Gay, Bisexual, Questioning, Queer, Not heterosexual, Other (for other, please explain...)”*); a closed question about whether they would use Rainbow SPARX; and, another closed question about whether or not they had suffered from feeling down or low for more than a few days. Professionals were asked: their designation (i.e. *“Please circle below which applies for you: Mental health professional, Commissioner, LGBQ Stakeholder, Other (for other, please explain...)”*); gender/gender identity; ethnicity; and if they would recommend the use of Rainbow SPARX. Despite considerable attempts to recruit parents of LGBT+ young people, none were enrolled in this study (i.e. no parents completed the brief questionnaire or participated in an interview or focus group).

In total three focus groups (which were young people and the LGBT+ staff members responsible for these groups only) and five interviews (one LGBT+ young person interview and four interviews with professionals) occurred during 2017. They lasted between 51 minutes and 1 hour and 24 minutes (mean length 62 minutes).

### Data analysis

We used a general inductive approach for data analysis [29,30]. This approach focuses on eliciting views and perspectives of participants using pre-existing research objectives, rather than generating new theories. A thematic analysis was used because the aim was to explore common themes and interrelationships between themes [30]. Focus group and interview transcripts were read and re-read with the research objectives in mind by ML, RS and II. Initial codes were



independently developed by ML, RS and II for a focus group and two interviews, and after discussion a common coding framework was developed. This framework was applied by ML and RS to all interviews and focus groups. Codes were then reviewed for redundancies and overlap, before higher order units were created and clustered together. Themes and sub-themes were developed and agreed upon in consultation with all authors. Microsoft Excel 2013 was used to manage the data and support analyses.

## Results

### Participants

Twenty-one LGBT+ youth participants took part in three focus groups and one interview (see Table 1 for details). LGBT+ youth participants were aged between 15 to 22 years old (mean age=17.9 years). Six health and social care professionals participated; two were NHS commissioners (one managerial and one clinical), three professionals had expertise in LGBT+ youth mental health, and one participant was experienced at developing e-therapies.

Table 1. Participants' demographic information

<i>Format (Researcher/s present) [Setting]<sup>a</sup></i>	<i>Participant number</i>	<i>Participant/s</i>	<i>Age</i>	<i>Sexuality</i>	<i>Gender/ gender identity</i>	<i>Ethnicity</i>
Group interview 1 (ML & LW) [Participants' workplace]	P1	Professional (Commissioner)	-	-	"Male"	"White British"
	P2	Professional (Commissioner)	-	-	"Female"	"White Other"
Individual interview 2 (ML) [Participant's workplace]	P3	Professional (LGBT+ stakeholder)	-	-	"Male"	"White British"
Individual interview 3 (ML) [Participant's workplace]	P4	Professional (Mental health)	-	-	"Male"	"White British"
Individual interview 4 (ML) [Participant's workplace]	P5	Professional <sup>b</sup> (LGBT+ stakeholder)	-	-	"Male"	"White British"
Focus group 1 (ML) [LGBT+ youth center]	P6	Professional <sup>c</sup> (Mental health)	-	-	"Female"	"Black British"
	P5	Professional <sup>b</sup> (LGBT+ stakeholder)	-	-	"Male"	"White British"
	YP1	Young person	18	Gay	"Male"	"White British"
	YP2	Young person	19	Not heterosexual	"Male"	"White British"
	YP3	Young person	19	Questioning	"Male"	"White British"
	YP4	Young person	21	Queer	"N/A"	"White Irish"
	YP5	Young person	18	Gay	"Male"	"White British"
	YP6	Young person	21	Queer	"Non-binary"	"White British"
	YP7	Young person	22	"Pansexual"	"FTM"	"White British"
	YP8	Young person	16	Gay	"Male"	"Mixed"
	YP9	Young person	18	Gay	"Male"	"WB [White British]"
	YP10	Young person	18	Bisexual	"Female"	"White British"
	YP11	Young person	19	Gay	"Male"	"White British"
Individual interview 5 (ML & RS) [City library]	YP12	Young person	19	Gay	"Male"	"White British"
Focus group 2 (ML) [Community center]	YP13	Young person	17	Bisexual & questioning	"Slightly queer"	"Caucasian [sic]"
	YP14	Young person	20	Lesbian	"Female"	"White Welsh"
	YP15	Young person	15	Not heterosexual & "Asexual"	"Trans female"	"Caucasian"
	YP16	Young person	17	Queer	"Queer"	"White British"
	YP17	Young person	17	"Pansexual"	"Woman"	"White Welsh"
	YP18	Young person	16	Lesbian	"Female"	"White British/ Welsh"
Focus group 3 (ML) [LGBT+ youth center]	P6	Professional <sup>c</sup> (Mental health)	-	-	"Female"	"Black British"
	P5	Professional <sup>b</sup> (LGBT+ stakeholder)	-	-	"Male"	"White British"
	YP19	Young person	15	"Transgender/ pansexual"	"FTM Transgender"	"White British"
	YP20	Young person	15	Gay, questioning, queer, & not hetero.	"Male cisgender"	"White British"
	YP21	Young person	15	Gay, questioning, queer, & not hetero.	"Male"	"Black British"

<sup>a</sup> Interviews and focus groups were conducted in private spaces. <sup>b</sup> This professional attended x 2 focus groups & participated in an individual interview. <sup>c</sup> This professional attended two focus groups.

Figure 2 provides an overview of the study's results. There were three main overarching domains, specifically: Using the internet and being online; Computer games and serious gaming; and, The wellbeing needs and support of LGBT+ young people. Each domain included two or three themes, and then several associated sub-themes.

### ***Using the internet and being online***

Perceptions of technology and the internet today

- Ubiquitous access to the internet
- Acceptability and engagement
- Problematic aspects of the internet
- Internet safety and security

The internet as a resource and tool

- Seeking information online
- Finding and accessing 'good information' online
- Empowerment enabled online
- Widening access via technology <sup>d</sup>

Digital and personal connections

- Digital communities and interpersonal communication
- Online media and company
- Online interpersonal support

### ***The wellbeing needs and support of LGBT+ young people***

Recognizing and acknowledging the experience of LGBT+ young people

- Stigma and dual stigmas
- Isolation and visibility
- Young people accessing professional help
- Establishing online LGBT+ communities

Preferences and requirements for therapy and e-therapy

- Keeping up with technological developments
- Demonstrating effectiveness <sup>d</sup>
- Supervised self-help <sup>d</sup>
- Overt versus stealth therapy
- Overcoming commissioning challenges <sup>d</sup>

### ***Computer games and serious gaming***

Drawing on gaming experiences

- Gaming audience
- Technical expectations <sup>e</sup>
- Varied gameplay preferences <sup>e</sup>

Rainbow SPARX as a resource for LGBT+ young people

- Purpose of Rainbow SPARX <sup>e</sup>
- Niche audience
- Avatar representation <sup>e</sup>
- LGBT+ specific content <sup>e</sup>

Look and feel of Rainbow SPARX

- Look and presentation <sup>e</sup>
- Feel and experience

**Figure 2. Overview of results**

<sup>d</sup>Sub-themes of particular salience to professionals; <sup>e</sup>Sub-themes of particular salience to LGBT+ young people

### Using the internet and being online

The domain of 'using the internet and being online' consisted of three themes: perceptions of technology and the internet today; the internet as a resource and tool; and, digital and personal connections.

#### *Perceptions of technology and the internet today*

Several LGBT+ young people and professionals highlighted that the internet is ubiquitous and influential:

*"I think we have grown up and been shaped by the internet, so we know it intrinsically in a way that perhaps older generations don't..."*

(YP16, Young person, Focus Group 2)

*"It's fast; it's there; they [LGBT+ young people] have access to [the] internet practically everywhere."* (P5, Professional, Interview 4)

In contrast, the minority of young people who do not have ready access to the internet were viewed by participants as being socially excluded.

It would appear that from an early age, youth participants begin to discern online resources in terms of their acceptability, and this is then used to assess the suitability of online solutions for different aspects of their lives:

*"...there's online counselling or online suicide helplines, so if you're feeling suicidal or depressed or whatever or you're going to relapse on drugs or self-harm then you can have like this, either you can call a number, you can find that on the internet, or you can do an online chat, which I think is really good, because most people, calling someone makes you feel quite anxious and stuff and I think a lot of people don't want to call, because it's a lot of effort."*

(YP20, Young person, Focus Group 3).

Online environments were viewed as being unhealthy or unhelpful in several ways by a range of participants. For instance, LGBT+ youth participants cited "Pro-ana" and self-harm sites that "glamorize" mental health problems, like anorexia and self-harming, as problematic. Professionals also described ways in which the internet creates difficulties for young people, in either a more general sense (e.g. by young people spending too much time online and hence avoiding the 'real world') or in very specific ways. For example, considering how online pornography can generate issues for LGBT+ young people:

*"[it] can maybe make people feel less confident about their bodies, less confident about their sex and their relationships as a result..."*

(P3, Professional, Interview 2).

For professional and LGBT+ youth participants, internet safety and security issues were important, including: the risk of LGBT+ young people being outed online;



challenges around how suicidality was safely managed in an online context; and how LGBT+ young people can be specifically targeted for sexual exploitation. For these reasons, digital privacy and confidentiality appeared to be of fundamental importance. As described in Focus Group 2, with many LGBT+ young people adapting how they used technology for reasons of self-preservation and avoiding harassment:

*"It's like you can get stalked on Snapchat now." (YP13, Young person)*

*"Yeah." (YP17, Young person)*

*"That's the other thing. You can also put the ghost mode on so you can't be followed." (YP13, Young person)*

*"Yeah, because I've only chosen a few people that can see my location and [YP16 is] one of them." (YP17, Young person)*

#### *The internet as a resource and tool*

LGBT+ youth participants sought resources and material online for reasons such as job searching, obtaining information and to acquire health-related information (e.g. *"...how to put a condom on"*). Some young people were aware of various organizations that had websites that they could access to support their mental health, and cited national examples such as Childline, MIND and Stonewall. YouTube was also mentioned as a resource for mental health by several LGBT+ youth participants, for example:

*"...YouTube videos of like, because I have anxiety and my counsellor suggested doing something called, well, they suggested doing something called mindfulness, so like there are just some good videos on the internet of guided meditation and stuff which helps me through my anxiety." (YP20, Young person, Focus Group 3)*

A common challenge mentioned by several professionals and LGBT+ youth participants was finding and accessing 'good information' online. As a professional highlighted:

*"...the issue with the internet is you have to know which of these multitude of sites is the one for you." (P4, Professional, Interview 3)*

Several participants shared examples of how the internet was an empowering tool or force for LGBT+ young people. For instance:

*"RUComing Out [a LGBT+ website], which shares celebrities but also real people's experiences of coming out...And through that as a means to actually learn, discover, feel like there's someone like them out there is really good" (P3, Professional, Interview 2).*

Professionals in particular highlighted that the internet was a valuable medium by which access to mental health services could be widened to potentially include “24/7” support. However, LGBT+ young people were acknowledged as being one of the “hard to reach groups” and that there would be some people who would not be comfortable accessing mental health services online. Professionals also reinforced that any help online should be blended with face-to-face therapy treatment options.

#### *Digital and personal connections*

Social media enabled LGBT+ young people to communicate freely with others and to be part of online communities, something that was especially important to several youth participants:

*“I think with LGBT people it’s different, because I’d say we’re a more, what’s it called, a hated group by some people, and a bullied group so we would need more support.” (YP20, Young person, Focus Group 3)*

LGBT+ young people can also usefully connect with others that share their experiences and provide support online in ways that would be difficult for them to do in-person:

*“...[The internet is] a really big support system... because not all, but most of the LGBT community have had hard times and they can all identify and relate with each other, so for the older [members of the] community they help out the younger [LGBT+ people] that are struggling.” (YP19, Young person, Focus Group 3)*

The internet was used for entertainment purposes (e.g. to watch sports, shop online and listen to music), as well as for other reasons. For instance, pornography was viewed as being both fun and for “sex education”, whilst selected forms of online media provided helpful distraction (or company):

*LGBT+ young person: “Yeah and I also use the internet, when I’m feeling low and depressed I also use it to distract myself. It’s a good coping mechanism, because it’s better than self-harming or getting too deep into my thoughts and having all these suicidal thoughts in my head, I can watch YouTube videos or I can go on Instagram or Tumblr or whatever...” (YP20, Young person, Focus Group 3)*

#### *Computer games and serious gaming*

The domain of ‘computer games and serious gaming’ consisted of three themes: drawing on gaming experience; Rainbow SPARX as a resource for LGBT+ young people; and, the look and feel of Rainbow SPARX.

### *Drawing on gaming experiences*

Most of the LGBT+ youth participants reported playing a range of commercial games (e.g. Rage, Skyrim, Mortal Kombat and The Sims). They also outlined a variety of gameplay preferences: the game's style of graphics; whether the game had a prologue; the amount of dialogue that was used; and the degree of violence portrayed.

Some participants could see the therapeutic value of commercial games for mental health, as outlined by an LGBT+ young person:

*"I play a lot of the Lego games, just because they're all the same controls and it's easy and they're so not stressful...I can just sit there and just zone out and just do anything, because they're meant for like five-year-olds, so it's fantastic." (YP17, Young person, Focus Group 2)*

However, despite serious games being seen by some as valuable for those uncomfortable engaging with face-to-face therapy, challenges were identified for developing a serious game that would be acceptable to a range of LGBT+ young people. For instance, participants noted that such games would need to work for those of different abilities, levels of maturity, and stages of acceptance and understanding of their LGBT+ identity/ies.

LGBT+ youth participants in particular highlighted that a mental health serious game should be available across a range of online platforms (e.g. on smartphones, computers as well as tablets). Moreover, a mobile serious game should not take up too much data storage.

### *Rainbow SPARX as a resource for LGBT+ young people*

After trialing module 1 of Rainbow SPARX during their interview or focus group, LGBT+ and professional participants recognized the purpose of the program (i.e. it was intended to be a mental health tool for LGBT+ young people). However, several youth participants really wanted a more explicit focus on them and their particular needs, and some participants felt that Rainbow SPARX was inadequate as an LGBT+ resource:

*"...they don't focus on the LGBT side of it, point blank, it is just mental health and I think if you were to do that it needs to be marketed as such. You can't just change a few words around and have a slightly different message at the start and say 'oh yeah it's a completely different game for LGBT people'." (YP16, Young person, Focus Group 2)*

Several LGBT+ youth participants also indicated that the language used in Rainbow SPARX was sometimes problematic: *"...it mentions guys who like guys, like why don't they just use the proper term? [i.e. gay]" (YP18, Young person, Focus Group 2).*

In contrast, professionals appeared less concerned about whether the program had sufficient LGBT+ content, and appeared more focused on whether Rainbow SPARX was too niche to be viable for a roll out:

*“I think there would be, given we’re talking about already a minority group. I think a minority of that minority group would find that platform quite attractive to use perhaps” (P1, Professional, Interview 1).*

Some LGBT+ youth participants also raised concerns about the avatar in Rainbow SPARX, in particular the forced sex binary inherent in the program (i.e. the user can only customize a male or female avatar with “no in-between” option). Even though the avatars could already be customized in gender non-conforming ways (e.g. the male avatar can have a ‘girl haircut’ and wear luminous pink clothes), it was thought to be especially important to some youth participants to have non-binary options for gender diverse users of the program.

#### *Look and feel of Rainbow SPARX*

Several LGBT+ youth participants liked the “concept” of Rainbow SPARX, and they appeared to enjoy using the program: *“Do you know, I’d definitely play that...”* (YP1, Young person, Focus Group 1). Furthermore, the affective experience for some youth participants using the program was positive:

*“I really liked it. I would play it if it was released. I think it’s good, like it’s entertaining just as a game like if you were feeling stressed or bored or sad it would just take your mind off of it because it’s quite fun to do and then also I think it is good just the messages and stuff, I don’t know, it just cheered me up.”* (YP12, Young person, Interview 5)

By contrast a few young people reported that Rainbow SPARX was “patronizing” and that it would not be helpful for LGBT+ young people. In addition, participants also suggested that Rainbow SPARX was dated or needed refining in terms of the graphics *“...I don’t know exactly how it all plays out in the computer game world. But I think it’s pretty cutting edge...and that if you’re competing with that then that’s [Rainbow SPARX] going to look I think quite basic in comparison ...”* (P3, Professional, Interview 2). They also highlighted issues in terms of speed *“It needs to be faster, it’s far too slow”* (P1, Professional, Interview 1) and the controls *“I feel like maybe the actions and the freedom to move and what you could do on the game could be developed, like the movement was quite simple and stuff like just playing it and fighting the bad spirits...”* (YP12, Young person, Interview 5).

There was also some discussion between LGBT+ youth participants about whether the spoken dialogue in Rainbow SPARX was always understandable. There were times when young people seemed to struggle with the Māori (New Zealand indigenous language) phrases used in the program and a character’s accent. For example the term takatāpui (a traditional Māori term meaning ‘intimate companion

of the same sex') was used in Rainbow SPARX, and this was a new word for participants in this study.

### The wellbeing needs and support of LGBT+ young people

This domain consisted of two themes: Recognizing and acknowledging the LGBT+ youth experience; and preferences and requirements for therapy and e-therapy.

#### *Recognizing and acknowledging the experience of LGBT+ young people*

LGBT+ youth participants described forms of mistreatment and other challenges that their heterosexual peers would not face. In particular, their family not accepting them because they are LGBT+ and the difficulties associated with accepting oneself, in part because of internalized negativity:

*"...So when I was sprouting into the blossom that I am now, that part of the conflict came from not knowing what it [my own LGBT+ specific identity] was. And the only context I'd ever heard of it being in-between was in like a promiscuous context like 'oh that's what people do if they have loose morals or anything'." (YP17, Young person, Focus Group 2)*

Furthermore, being transgender was described as being more stigmatized and resulting in increased mistreatment by a few participants, compared to those who were diverse in terms of their sexuality:

*"I think trans people are probably more at risk than LGB people, because it's less normalized...So it's like really overwhelming and stuff and I feel like, I don't know, I feel like there's more people on the internet preying on T people than LGB generally, because it's easier to spot someone out and there's more trans people who are like excluded from their families and stuff." (YP12, Young person, Interview 5)*

LGBT+ youth participants recognized that dual stigma could be an issue for LGBT+ young people, whereby they could be faced with the stigma associated with having mental health problems, as well as the stigma linked to being LGBT+. Being isolated was also reported to be an issue, with this being *"probably the worst thing"*. To combat this, participants mentioned the value of LGBT+ characters on television and LGBT+ celebrity role models who were *"completely unapologetic"* about who they are (for example, Stephen Fry and Sir Ian McKellen), as a way to increase visibility.

Professionals also recognized that stigma creates barriers to LGBT+ young people getting help:

*"I think almost this group has double stigma because you would have the one around disclosing that you might have some mental health difficulties, and then the additional stigma of being, lesbian, gay, or transsexual on top of that. So*



*there would be quite a lot of barriers for you to come out and start talking about how you feel about things.” (P2, Professional, Interview 1)*

Developing and maintaining LGBT+ communities online was especially important for youth participants. This allowed them to date other LGBT+ young people; engage in leisure activities with other LGBT+ youth (e.g. an online friendship had the potential to lead to face-to-face activities); and, it provided a sense of LGBT+ community and belonging.

#### *Preferences and requirements for therapy and e-therapy*

Participants reinforced that CD-ROMs and websites were viewed as outdated means by which to offer an intervention. Access issues would also need to be taken into account, for instance Wi-Fi is not always freely available to young people, so it was recommended that online e-therapies have a downloadable option. Serious games presented their own set of problems in terms of the need to move in line with expectations based on commercial games:

*“I think what you need to think about as well is the life span of the game. So gaming in general will have updates every single year because there is quite a lot of competition.” (P2, Professional, Interview 1)*

Some professional participants were particularly concerned with the effectiveness of an e-therapy. Randomized controlled trials (RCTs) were cited as a means to provide the evidence required to demonstrate that an e-therapy was effective and so the focus was on demonstrating effectiveness at a population level, though their limitations were recognized:

*“I suppose it's a question about a rigorous evaluation, you know, like an RCT, versus something which is, I don't know, a sort of user-experience evaluation where we're not going to randomize people because if people want to use it then they should be able to use it, you know, rather than saying well, fine but we're going to randomize you to a waitlist control now.” (P4, Professional, Interview 3)*

In contrast, LGBT+ youth participants seemed to evaluate cCBT interventions (like Rainbow SPARX), more generally, in terms of their ideas about the perceived usefulness of the CBT content:

*“...where it [Rainbow SPARX] said things that you can do or ways you can think to change how you feel. Which is a concept that works but sometimes it's really not helpful to hear. And it's obviously not that exciting.” (YP4, Young person, Focus Group 1)*

Professional participants were especially concerned that any e-therapy has sufficient moderation and guidance in order to ensure risk is managed effectively. There was a consensus amongst professionals that an e-therapy should be provided

in a blended way, so that LGBT+ young people always had the option of face-to-face therapy, if required.

Amongst LGBT+ youth participants there was some debate about how explicit therapy should be in a serious game, with some suggesting that this should almost be achieved by stealth:

*“So do you think there’s a way that you could innovate the game to where it’s not therapy talk but it, it’s not therapy talk but it doesn’t feel like therapy, it’s just, it’s a way of not thinking that it’s therapy talk” (YP4, Young person, Focus Group 1).*

Commissioning e-therapies on the NHS requires certain criterion be met, specifically around effectiveness and safety, as explained by a commissioner:-

*“...in our specification we will have a standard sentence around that it has to be evidence-based. And you sort of hang all sorts of things off that really. So in the procurement process we went through they had to show us evidence of how that particular sort of online service was going to work and that it was going to be safe.” (P2, Professional, Interview 1)*

However, commissioning was acknowledged by some professionals to involve further challenges, in that in order for an e-therapy to be “attractive” for a health service commissioning body it would need to be relevant to “a huge group” of young people for each commissioning body to support its implementation.

### Questionnaire responses

Eighteen (86%) of the 21 LGBT+ youth participants indicated that they had felt down or low in the past (based on the single question “Have you ever suffered from feeling down or low for more than a few days in a row?”). The remaining three participants (YP8, YP9 and YP11) reported having not previously suffered from feeling down or low. Most professionals said that they would recommend Rainbow SPARX to an LGBT+ young person that was “feeling down” (n=4 participants, 67%), whilst only 38% (n=8) of the youth participants reported that they would use Rainbow SPARX if “feeling down”. Most participants provided comments about why they would or would not use (or recommend) the program (see Table 2).

Table 2. Participants' written responses

<b>Professionals</b>	
<i>Would recommend use of Rainbow SPARX</i>	<i>Comments</i>
Yes (n=4)	<ul style="list-style-type: none"> <li>• "I would recommend that they try it, but would follow up to see if they felt their needs were met, or if further assistance was required" (P1, Professional, Interview 1)</li> <li>• "Yes in principle, but would like to see final version [i.e. all 7 modules] first before recommending" (P2, Professional, Interview 1)</li> <li>• "As part of or accompanying face-to-face intervention" (P3, Professional, Interview 2)</li> <li>• "I think it's a great, accessible self help tool" and "Lovely game, very useful, accessible" (P5, Professional)<sup>f</sup></li> </ul>
Possibly (n=1)	<ul style="list-style-type: none"> <li>• "Possibly – depends on whether they feel the internet intervention would be helpful. Many prefer face to face interventions" (P4, Professional, Interview 3)</li> </ul>
No (n=1)	<ul style="list-style-type: none"> <li>• "I think they need someone to talk to face to face" and "It will provide extra support" (P6, Professional)<sup>g</sup></li> </ul>
<b>Young people</b>	
<i>Would use Rainbow SPARX</i>	<i>Comments</i>
Yes (n= 8)	<ul style="list-style-type: none"> <li>• "I enjoyed it" (YP12, Individual interview 5)</li> <li>• "It's awfully good" (YP17, Focus group 2)</li> <li>• "For anxiety and when my mood is especially low" (YP 19, Focus group 3)</li> <li>• "For anxiety" (YP20, Focus group 3)</li> <li>• "I think it could help up to a poin[t] [sic]" (YP21, Focus group 3)</li> </ul> <p>Participants YP1, YP3, and YP11 did not provide a written comment <sup>h</sup></p>
No (n=13)	<ul style="list-style-type: none"> <li>• "I have nothing to add" (YP2, Focus group 1)</li> <li>• "Would rather develop skills when better" (YP4, Focus group 1)</li> <li>• "Bit too basic and CBT for my liking" (YP6, Focus group 1)</li> <li>• "I'd see my care coirdinator [sic] instead" (YP7, Focus group 1)</li> <li>• "I don't require a game to make me feel better I have [P5, Professional – LGBT+ stakeholder] and [P6, Professional – Mental health]" (YP8, Focus group 1)</li> <li>• "I don't think it would help me" (YP13, Focus group 2)</li> <li>• "More of a distraction than how to solve a problem" (YP14, Focus group 2)</li> <li>• "Outdated system/terms" (YP15, Focus group 2)</li> <li>• "No thanks" (YP16, Focus group 2)</li> <li>• "Skims over topic at hand" (YP18, Focus group 2)</li> </ul> <p>Participants YP5, YP9, and YP10 did not provide a written comment <sup>h</sup></p>

<sup>f</sup> The same participant completed two surveys; <sup>g</sup> The same participant completed two surveys; <sup>h</sup> Not all LGBT+ youth participants provided a written comment in relation to their yes/no response, for reasons unknown to the authors.

## Discussion

### Principal results

This study sought to explore two main research objectives. Firstly, to explore how and why LGBT+ young people use the internet to support their mental health. This is important to consider in order to minimize the risks of developing interventions that do not address LGBT+ users needs, or do not fit in well with how LGBT+ young people use the internet. Notably, rather than accessing existing e-therapies developed for the general youth population, young people in our study created personal pathways to use the internet for enhancing their mental health (e.g. by locating resources on mindfulness via YouTube). Their apparent lack of knowledge about e-therapies, combined with the challenges associated with finding and accessing 'good information online', suggests that even if LGBT+ e-therapies were made available, they would be difficult for LGBT+ young people to locate. Therefore, it is not simply the development of e-therapies and demonstrating their effectiveness that needs consideration, but also their dissemination and ensuring they are adequately and appropriately supported in the real world [31]. Another issue of relevance for LGBT+ young people was cyberbullying and stalking. Professional participants in particular were concerned about the safety and the personal security of LGBT+ young people online, and described concerns about the risk of online sexual exploitation. Hence e-therapies for LGBT+ young people will need to carefully consider these issues in their development, evaluation and implementation.

The second objective of this study was to elucidate whether LGBT+ young people and professionals consider an e-therapy, like Rainbow SPARX, to be a useful tool to assist in supporting the mental health of LGBT+ young people. Most of the professionals indicated that they would recommend the program to an LGBT+ young person that was "feeling down", whilst only eight out of the 21 LGBT+ young people indicated that they would use Rainbow SPARX in this context. In part, usefulness will be about effectiveness, but another important factor to consider is acceptability. A key means by which to enhance acceptability is to utilize co-design or co-production processes. This study found diverse attitudes to gaming preferences, as well as different opinions about the appeal of Rainbow SPARX and factors related to LGBT+ identities. It will be important that future e-therapy co-design approaches for this population pay special attention to ensuring that a range of LGBT+ individuals take part in these processes, in particular transgender young people [32]. Rainbow SPARX was originally developed by employing co-design methods [6]. Yet these processes occurred some years ago and in a different cultural context (that of New Zealand). Since LGBT+ young people are coming out at increasingly early ages [33], they are now even more likely to require content that is specific to their experiences as LGBT+ individuals, especially since the majority of existing LGBT+ services are provided for adults in large urban centers. Another challenge relates to the use of serious games as a therapeutic medium. In particular, the pressure to remain as up-to-date as possible relative to commercial games, as

these games appear to be the base of comparison from which young people draw upon when critiquing an e-therapy delivered in a game-like format.

### Comparisons to prior research

A considerable body of research has been published which reinforces that LGBT+ young people are an 'at risk' population in terms of their mental health. However, to date very few studies have focused on the means by which to address the mental health problems that arise from hostile environments [4] from which LGBT+ young people may not be able to escape. For instance, in a recent systematic review of empirically-based psychological treatments conducted with LGBT+ young people, Hobaica and colleagues identified only eight such interventions [20]. Three of these interventions were online, specifically: Rainbow SPARX; 'Queer Sex Education' (an inclusive sex education intervention); and an online drug abuse prevention intervention [20]. Another similar systematic review, conducted by Van Der Pol-Harney and McAloon [10], highlighted only one e-therapy for mental health problems (i.e. Rainbow SPARX). However, the e-therapy field is rapidly evolving and the developers of AFFIRM (a group-based CBT intervention for LGBT+ young people, cited in both reviews) [34] have highlighted their intentions to expand their program. In particular, it is hoped that in the future AFFIRM can be delivered in an online format [35]. We identified another e-therapy intervention in the field of LGBT+ mental health called TODAY. This tool is a mobile phone intervention for the treatment of anxiety and depression and was developed in the United States. TODAY has been subjected to usability testing [36]. But to date it has been exclusively evaluated in order to inform further development amongst gay-identified young men (18 to 20 years old) [36]. Given that online psycho-social tools are valued by LGBT+ young people [16] and that they can be made accessible to socially and geographically isolated individuals [5], effective and acceptable e-therapies should be made available to LGBT+ young people in the UK and elsewhere. It is probable that funders of e-therapies may argue that the target population is not large enough to justify the investment. But given the extent of the problems [1,3], that LGBT+ young people are coming out earlier [33], and that therapy access issues have previously been identified [9], early intervention is warranted. Roll-out is also likely to be more cost effective if LGBT+ resources can be funded across several clinical commissioning groups or public health departments.

In order for e-therapies to be used meaningfully by LGBT+ young people they will need to include relevant content. Whilst e-therapies are demonstrably important tools in addressing mental health problems, the vast majority are designed for a general population [37]. But these 'mainstream' tools do not address the needs of LGBT+ individuals. For instance, Rozbroj and colleagues reviewed web- and app-based interventions for the prevention and treatment of depression and anxiety in relation to the degree to which they would meet the needs of lesbians and gay men (of note, the review was not inclusive of bisexual or transgender individuals). They found that the tools largely neglected core issues for lesbians and gay men [37], such that more than half (14 out of 24 interventions) contained instances that assumed



or suggested the user was heterosexual. Moreover, only one intervention explicitly addressed homonegativity, and only one tool referred to same-sex relationships [37].

Given the findings from the current study which indicated that a minority of LGBT+ young people who participated in this study would use Rainbow SPARX, and discussion revealed that others might if the content and format were improved, this research suggests that adapting existing resources designed for LGBT+ youth can be a worthwhile endeavor. Nonetheless, whether new LGBT+ specific e-therapies are created or whether they are modified from existing interventions, to ensure they are up-to-date all e-therapies need to be more rapidly tested and implemented [38].

### Implications

In this exploratory study we have highlighted that LGBT+ young people are interested in mental health support via the internet and that e-therapies should be tailored for LGBT+ young people and their cultural context. We have further identified that the needs and preferences of LGBT+ young people are diverse and in some cases, polarized. For example the affective experience with Rainbow SPARX included those LGBT+ young people reporting positive emotions associated with the program and others, in contrast, who felt patronized by the language used within the game. It may not be as simple as developing one tool or approach that suits all LGBT+ young people. However, there could be future scope to develop multiple 'layers' within the same e-therapy (game-based or otherwise) that are tailored to appeal to different developmental or maturity levels. This is an approach we intend to explore more fully in the future. An approach that is personalized in this way could allow for the customization of language and design that is deemed acceptable for a wide range of LGBT+ young people. This would be useful, because choice and control are obviously important considerations in the design of serious games for adolescents [39]. Furthermore, this study has shown that timeliness or recency of approach is important, because internet interventions date and the expectations of LGBT+ young people appear high.

### Limitations

This is a small-scale exploratory study, and as is not uncommon in research conducted in the area of LGBT+ mental health, recruitment had its challenges [27]. The study included four LGBT+ young people over the age of 19 (whereas Rainbow SPARX was designed for young people up to this age) with the oldest participant being 22 years old. However, these participants were established members of their youth group, they were keen to take part in a focus group, and they provided useful insights, as young people just outside of the initial target age range.

This study's sample was not representative of all LGBT+ young people in the UK, or the professionals working with them. Furthermore, not all LGBT+ youth organizations in the UK are likely to have been contacted, especially those organizations that do not have a web presence outside of London, Cardiff, Manchester, Edinburgh and Belfast. Some young people from the organizations

contacted may not have heard about this study. Regardless of our attempts to recruit them, no parents or guardians of LGBT+ young people took part in this study. Despite this, we had a range of LGBT+ young people and professionals taking part in this study, including young people questioning their sexuality and those who were non gender-binary. We had a strong sense that no new concepts or ideas were raised upon the conclusion of focus group 3. Transcripts were not returned to LGBT+ youth or professional participants for comment, or for participant feedback on the findings. No field notes were taken.

When using Rainbow SPARX in focus groups only one young person played the game at a time, whilst others watched and commented. However, Rainbow SPARX was designed for use in a single player format. It is therefore possible that using the program in this manner influenced how much participants were able to engage with this e-therapy. Moreover, participants knew that ML led the development of Rainbow SPARX, and as such young people may have felt reserved in relation to expressing criticisms of the program. To attempt to remedy this, every participant was explicitly asked to comment on what they did not like about Rainbow SPARX. Nonetheless, it is possible that the results are skewed towards a more positive view of the program. In focus groups 1 and 3 the professionals responsible for these youth groups chose to attend these focus groups. The inclusion of these professionals in two youth focus groups is a limitation, as their presence may have influenced what young people said. But professionals' data from the focus groups was not included in analyses, and our impression is that having these professionals present made young people feel at ease.

## Conclusions

LGBT+ young people frequently experience stigma and isolation, and they also have high mental health needs. The internet is an important source of information and support for these young people and e-therapies appear particularly valuable for this unique population. In the current study, the first where Rainbow SPARX was used outside of New Zealand, LGBT+ young people emphasized that e-therapies must be appealing, up-to-date and inclusive of LGBT+ specific content. Professional participants reinforced the need for proof of efficacy and that an e-therapy appeals to a sizeable proportion of a population. LGBT+ specific e-therapies like Rainbow SPARX show promise, but only those that are tested sufficiently should be made available to support the mental health of LGBT+ young people. To reduce costs and increase access these tested interventions should be considered for implementation by commissioners across wide geographical areas.

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## Conflicts of Interest

The intellectual property for SPARX is held by UniServices at the University of Auckland. Any proceeds from licensing or selling SPARX outside of New Zealand will be shared in part with UniServices and KS, TF, MS, and ML. LW is a Non-Executive Director of the health service where recruitment of commissioners took place for this study.

## References

1. Lucassen MFG, Stasiak K, Samra R, Frampton CMA, Merry SN. Sexual minority youth and depressive symptoms or depressive disorder: A systematic review and meta-analysis of population-based studies. *Aust. New Zealand J. Psychiatry*. 2017;51(8):774–787. DOI: 10.1177/0004867417713664
2. Clark TC, Lucassen MFG, Bullen P, et al. The health and well-being of transgender high school students: Results from the New Zealand Adolescent Health Survey (Youth'12). *J Adolesc Health*. 2014;55(1):93-99. <https://doi.org/10.1016/j.jadohealth.2013.11.008>
3. King M, Semlyen J, Tai SS, et al. A systematic review of mental disorder, suicide, and deliberate self harm in lesbian, gay and bisexual people. *BMC Psychiatry*. 2008;8(1):1-17. <https://doi.org/10.1186/1471-244X-8-70>
4. Denny S, Lucassen MFG, Stuart J, et al. The association between supportive high school environments and depressive symptoms and suicidality among sexual minority students. *Journal of Clinical Child and Adolescent Psychology*. 2016;45(3):248-261. <https://doi.org/10.1080/15374416.2014.958842>
5. Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin*. 2003;129(5):674-697. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2072932/pdf/nihms32623.pdf>
6. Lucassen MFG, Hatcher S, Stasiak K, Fleming T, Shepherd M, Merry SN. The views of lesbian, gay and bisexual youth regarding computerised self-help for depression: An exploratory study. *Advances in Mental Health*. 2013;12(1):22-33. <https://doi.org/10.5172/jamh.2013.12.1.22>
7. McDermott E, Roen K, Piela A. Explaining self-harm: Youth cybertalk and marginalized sexualities and genders. *Youth & Society*. 2015;47:873 -889. DOI: 10.1177/0044118X13489142
8. Chiang SY, Fleming T, Lucassen M, Fenaughty J, Clark T, Denny S. Mental health status of double minority adolescents: Findings from national cross-sectional health surveys. *Journal of Immigrant and Minority Health*. 2017;19(3):499-510. DOI 10.1007/s10903-016-0530-z
9. Lucassen MFG, Merry SN, Robinson EM, et al. Sexual attraction, depression, self-harm, suicidality and help-seeking behaviour in New Zealand secondary school students. *Aust. New Zealand J. Psychiatry*. 2011;45(5):376-383. <https://doi.org/10.3109/00048674.2011.559635>

10. Van Der Pol-Harney E, McAloon J. Psychosocial interventions for mental illness among LGBTQIA youth: A PRISMA-based systematic review. *Adolescent Research Review*. 2018; epub ahead of press:1-20. <https://doi.org/10.1007/s40894-018-0090-7>
11. McDermott E, Roen K. Youth on the Virtual Edge: Researching marginalized sexualities and genders online. *Qualitative Health Research*. 2012;22(4):560-570. DOI: 10.1177/1049732311425052
12. Craig SL, McNroy LB, McCready LT, Di Cesare DM, Pettaway LD. Connecting without fear: Clinical implications of the consumption of information and communication technologies by sexual minority youth and young adults. *Clinical Social Work Journal*. 2015;43(2 ):159-168. DOI 10.1007/s10615-014-0505-2
13. Craig SL, McNroy LB, D'Souza SA, et al. Influence of information and communication technologies on the resilience and coping of sexual and gender minority youth in the United States and Canada (Project# Queery): Mixed methods survey. *JMIR Research Protocols*. 2017;6(9):e189. doi:10.2196/resprot.8397
14. Craig SL, McNroy L, McCready LT, Alaggia R. Media: A catalyst for resilience in lesbian, gay, bisexual, transgender, and queer youth. *Journal of LGBT Youth*. 2015;12(3):254-275. <https://doi.org/10.1080/19361653.2015.1040193>
15. Strauss P, Cook A, Winter S, Watson V, Wright Toussaint D, Lin A. *Trans Pathways: The mental health experiences and care pathways of trans young people (Full report)*. . Perth, Australia: Telethon Kids Institute; 2017.
16. McDermott E, Hughes E, Rawlings V. *Queer futures: Understanding lesbian, gay, bisexual and trans (LGBT) adolescents' suicide, self-harm and help-seeking behaviour (Main Results)*. London Department of Health (Policy Research Programme Project Understanding Lesbian, Gay, Bisexual and Trans (LGBT) Adolescents' Suicide, Self-Harm and Help-Seeking Behaviour- 023/0168); 2016.
17. McDermott E, Hughes E, Rawlings V. Norms and normalisation: Understanding lesbian, gay, bisexual, transgender and queer youth, suicidality and help-seeking. *Culture, Health & Sexuality*. 2018;20(2):156-172. DOI: 10.1080/13691058.2017.1335435
18. National Institute for Health and Clinical Excellence. *Computerised cognitive behaviour therapy for depression and anxiety*. London, United Kingdom: National Institute for Health and Clinical Excellence; 2006 (last modified May 2013).
19. Stasiak K, Fleming T, Lucassen M, Shepherd M, Whittaker R, Merry SN. Computer-based and online therapy for depression and anxiety in children and adolescents. *Journal of Child and Adolescent Psychopharmacology*. 2016;26(3):235-245. <https://doi.org/10.1089/cap.2015.0029>
20. Hobaica S, Alman A, Jackowich S, Kwon P. Empirically based psychological interventions with sexual minority youth: A systematic review. *Psychology of Sexual Orientation and Gender Diversity*. Advance online publication:1-11. <http://dx.doi.org/10.1037/sgd0000275>

21. Lucassen MFG, Merry SN, Hatcher S, Frampton C. Rainbow SPARX: A novel approach to addressing depression in sexual minority youth. *Cognitive and Behavioral Practice*. 2015;22(2):203-216.  
<https://doi.org/10.1016/j.cbpra.2013.12.008>
22. Lucassen MFG, Hatcher S, Fleming TM, Stasiak K, Shepherd MJ, Merry SN. A qualitative study of sexual minority young people's experiences of computerised therapy for depression. *Australasian Psychiatry*. 2015;23(3):268-273. <https://doi.org/10.1177/1039856215579542>
23. The Mental Health Taskforce. *The five year forward view for mental health: A report from the independent mental health taskforce to the NHS in England*. London: The Mental Health Taskforce; 2016.  
<https://www.england.nhs.uk/wp-content/uploads/2016/02/Mental-Health-Taskforce-FYFV-final.pdf>
24. Merry SN, Stasiak K, Shepherd M, Frampton C, Fleming T, Lucassen MFG. The effectiveness of SPARX, a computerised self help intervention for adolescents seeking help for depression: Randomised controlled non-inferiority trial. *British Medical Journal*. 2012;344(e2598):1-16.  
<https://doi.org/10.1136/bmj.e2598>
25. Shepherd M, Fleming T, Lucassen M, Stasiak K, Lambie I, Merry SN. The design and relevance of a computerized gamified depression therapy program for indigenous Māori adolescents. *JMIR Serious Games*. 2015;3(1):e1. doi:10.2196/games.3804
26. Griner D, Smith TB. Culturally adapted mental health interventions: A meta-analytic review. *Psychotherapy: Theory, Research, Practice & Training*. 2006;43(4):531-548. doi: 10.1037/0033-3204.43.4.531.
27. Lucassen MFG, Fleming TM, Merry SN. Tips for research recruitment: The views of sexual minority youth. *Journal of LGBT Youth*. 2017;14(1):16-30. DOI: 10.1080/19361653.2016.1256246
28. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007;19(6):349-357.  
<https://doi.org/10.1093/intqhc/mzm042>
29. Boyatzis RE. *Transforming qualitative information: Thematic analysis and code development*. Thousand Oaks, California: Sage Publications, Inc.; 1998.
30. Thomas DR. A general inductive approach for analyzing qualitative evaluation data. *American Journal of Evaluation*. 2006;27(2):237-246.  
<https://doi.org/10.1177/1098214005283748>
31. Sundram F, Hawken SJ, Stasiak K, et al. Tips and traps: Lessons from codesigning a clinician e-monitoring tool for computerized cognitive behavioral therapy. *JMIR Mental Health*. 2017;4(1):e2. doi:10.2196/mental.5878
32. Perry Y, Strauss P, Lin A. Online interventions for the mental health needs of trans and gender diverse young people. *The Lancet Psychiatry*. 2018;5(2):e6.  
[https://doi.org/10.1016/S2215-0366\(18\)30017-8](https://doi.org/10.1016/S2215-0366(18)30017-8)



33. Lucassen MFG, Clark TC, Denny SJ, et al. What has changed from 2001 to 2012 for sexual minority youth in New Zealand? *Journal of Paediatrics and Child Health*. 2015;51(4):410-418. <https://doi.org/10.1111/jpc.12727>
34. Craig SL, Austin A. The AFFIRM open pilot feasibility study: A brief affirmative cognitive behavioral coping skills group intervention for sexual and gender minority youth. *Children and Youth Services Review*. 2016;64:136-144. <http://dx.doi.org/10.1016/j.childyouth.2016.02.022>
35. Austin A, Craig SL, D'Souza SA. An AFFIRMative cognitive behavioral intervention for transgender youth: Preliminary effectiveness. *Professional Psychology: Research and Practice*. 2018;49(1):1-8. <http://dx.doi.org/10.1037/pro0000154>
36. Fleming JB, Hill YN, Burns MN. Usability of a culturally informed mHealth intervention for symptoms of anxiety and depression: Feedback from young sexual minority men. *JMIR Human Factors*. 2017;4(3):e22. doi:10.2196/humanfactors.7392
37. Rozbroj T, Lyons A, Pitts M, Mitchell A, Christensen H. Assessing the applicability of e-therapies for depression, anxiety, and other mood disorders among lesbians and gay men: Analysis of 24 web-and mobile phone-based self-help interventions. *Journal of Medical Internet Research*. 2014;16(7):e166. 10.2196/jmir.3529
38. Fleming TM, Bavin L, Stasiak K, et al. Serious games and gamification for mental health: Current status and promising directions. *Frontiers in Psychiatry*. 2017;7. <https://doi.org/10.3389/fpsy.2016.00215>
39. Cheek C, Fleming TM, Lucassen M, et al. Integrating health behavior theory and design elements in serious games. *JMIR Mental Health*. 2015;2(2):1-11. 10.2196/mental.4133