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An online intervention to support the mental wellbeing of sexual and gender minority young people in England: Co-design of 'Oneself'

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Abstract

Introduction

Sexual and gender minority youth (SGMY) are known to be at greater risk of compromised mental health when compared with their heterosexual and cisgender peers. This is considered to be due to an increased burden from stigma, discrimination, or victimisation resulting in the heightened experience of stress in their daily lives. Given increasing digital accessibility and a strong preference for support online amongst SGMY, digital interventions are a keyway to provide support to manage stress and maintain SGMY wellbeing. This paper aims to explicate the codesign processes and underpinning logic of *Oneself*, a bespoke online intervention for SGMY.

Methods

The research followed a six-stage process set out by Hagen and colleagues (Identify, Define, Position, Concept, Create, Use) incorporating: a systematic scoping review of existing evidence; focus groups with four stakeholder groups (i.e., SGMY, professionals who directly support SGMY, parents of SGMY, and UK public health service commissioners); a series of co-design workshops and online consultations with SGMY; the appointment of a digital development company; and young adult SGM contributors to create content that was grounded in authentic SGMY experiences.

Results

Oneself features a welcome/home page that includes a free ‘accessible to all’ animation explaining the importance of using appropriate pronouns, and the opportunity to create a user account and log-in to access further free content. Creating a user account provides an opportunity (for the user and the research team) to record engagement, assess users’ wellbeing and track progress through the available content. There are three sections of content in *Oneself* focussed on the priority topics identified through co-design; 1. coming out and doing so safely, 2. managing school, including homophobic, biphobic or transphobic bullying or similar, and 3. dealing with parents and families, especially unsupportive family members, including parents/caregivers. *Oneself*’s content focuses on identifying these as topic areas and providing potential resources to assist SGMY cope with these areas. For instance, *Oneself* drew on therapeutic concepts such as cognitive reframing, stress reduction and problem-solving techniques. There is also a section containing relaxation exercises, a section with links to other recommended support and resources, and a ‘downloads’ section with more detailed techniques and strategies for improving wellbeing.

Discussion

This paper contributes to research by opening up the ‘black box’ of intervention development. It shows how *Oneself* is underpinned by a logic which can support future development/evaluation and included diverse co-designers. More interactive techniques to support wellbeing would be a beneficial addition in further development. Additional content specific to a wider range of intersecting identities (such as being a care experienced Asian SGMY from a minority faith background) would also be beneficial in future *Oneself* development.

Keywords: Sexual minority; gender minority; LGBTQ+; Mental wellbeing; support; intervention; resilience; digital; codesign; SGMY.

Introduction

Globally, it is estimated that up to 10% of the adolescent population identify as being either a sexual or gender minority youth (SGMY), that is, they identify as either lesbian, gay, bisexual, transgender/trans, queer or as another sexual or gender minority (i.e., LGBTQ+)[1][2] [3]. SGMY are known to be at greater risk for poor mental health when compared with their heterosexual and cisgender peers [1][4]. This elevated risk is suggested to be largely related to an increased burden from stigma, discrimination, or victimisation resulting in the heightened experience of stress in their day-to-day lives [5][6]. Clearly, work needs to continue to improve social environments for SGMY, to reduce the additional stress they experience, but this will take time. In parallel, research is needed to identify what can be done to support SGMY to protect their mental health and wellbeing, and help them build the skills and resilience they will need to thrive. This is increasingly important for the youngest SGMY, as evidence suggests they are ‘coming out’ at an earlier age than previous generations [6][7]. Their younger age may mean they have had less time and opportunity to develop strong support networks and coping skills compared with those who come out at an older age [6][8].

Current and recent generations of young people have grown up in the digital age. Often referred to as ‘digital natives’ [9], they have only experienced a world with access to the internet [9]. The latest data suggest that almost all homes in the United Kingdom (UK) have access to the internet [10] and 97% of 12–15-year-olds have their own mobile phone, with the vast majority using it to access the internet [11]. Young people are also known to spend much of their time in online spaces, which can assist their early attempts to seek information or obtain support around the issues they face. Similarly, a UK Department of Health and Social Care commissioned report highlighted a strong preference amongst SGMY to access help on the internet, whereby 82.3% (n = 572) of SGMY participants reported being “likely” or “very likely” to choose support in this format [12]. For this reason, providing online resources to support SGMY, and the adults who assist them, could be a widely accessible and relatively low-cost public health approach to improving their health and wellbeing.

In this paper we present the detailed systematic steps we took to develop *Oneself*, a bespoke digital online resource, to support SGMY around some of the most pressing challenges associated with growing up and being a SGM young person. Drawing on the “Identify, define, position, concept, create, use” stages set out by Hagen et al. [13], for participatory design with young people in mental health promotion, the process initially involved: a scoping review of the strategies used in existing interventions [14]; in-depth interviews with adult experts who support SGMY, including parents of SGMY; and focus groups with SGMY. We then engaged in a co-design process, involving workshops with SGMY to determine priorities for the focus of the content, the look and feel of the resource and to develop aspects of the content itself. In addition to drawing on evidence from the scoping review we also drew upon the first-hand expertise of SGMY, as participatory research and co-design with intended end-users of interventions is essential for their optimisation in pragmatic terms. For example, knowledge about the needs of unique sub-populations may be limited and co-design processes can help enhance an intervention’s acceptability [15][16][17][18]. In instances where a group is frequently marginalised, such as SGMY, co-design is especially important because it represents a way to empower and democratise research and its outputs [19]. Co-design with under-served populations, including SGMY, allows for pertinent diversity considerations to be addressed, for instance factors around language, symbols, and character use in digital mental health technologies [20]. Hence co-design processes are an attempt to help inform the creation of acceptable resources, and to assist in not only avoiding further alienating populations like SGMY, but also offering them a voice and greater inclusion. The approach applied by Hagen et al

[13] was specifically chosen because it has been applied successfully in the past to support SGMY in terms of their mental health. Making intervention development processes replicable and transparent in how they are intended to bring about change for end users is also recognised as important for developing the science of health and wellbeing [21]. With this in mind, we outlined what we planned to do at the start of our project in our published study protocol [6]. This protocol was submitted in June 2021, prior to the project officially commencing.

Aim

This paper sets out the systematic stages involved in developing *Oneself* for SGMY and describes how the findings or outcomes from each stage fed into content development and refinements. It also aims to clearly explicate how each feature and its content is intended to support SGMY and promote change, so that any future research involving *Oneself* can incorporate evaluation against the logic that underpins it.

Methods

In accordance with our published protocol [6], we set out to follow stages in intervention co-design as outlined by Hagen and colleagues [13]. In Table 1 below we have mapped the six stages that Hagen et al. defined against our activities. Intervention development and co-design is rarely a straightforward linear process. In practice, some tasks need to happen in parallel and researchers and co-producers may need to cycle back and repeat elements of the process as additional challenges emerge and new insights arise. Below the table, we set out how we went about our activities during *Oneself*'s development in turn, but we also strive to clarify the overlaps and interconnections.

Table 1. Table setting out the six stages of co-design involving adult experts and sexual and gender minority youth (SGMY) mapped to project activities involved in developing a resource to support the mental wellbeing of SGMY in England; based on Lucassen et al. [6] in 2022, following the process set out by Hagen et al. [13]

	IDENTIFY	DEFINE	POSITION	CONCEPT	CREATE	USE
Methods which enable the active participation of SGMY	Focus groups with SGMY (see sub-section ii. below)	Focus groups with SGMY (see sub-section ii.)	Initial co-design workshops with SGMY and email/online consultation (see iv.)	Initial co-design workshops with SGMY and email/online consultation (see iv.) Questionnaire to assess 'look and feel' design options (see vi.)	Further co-design workshops with SGMY (see viii.)	Feedback from 'think aloud' user interviews (Lucassen et al. in prep.)
Other evidence-informed research activities	Systematic Scoping Review (see sub-section i. below) Interviews with adult experts	Systematic Scoping Review (see sub-section i.) Interviews with adult experts and parents (see	Appointment of digital developer (see iii.) Team co-development to finalise decisions and	Team co-development to finalise decisions and solutions (see 3.5) Appointment of SGM community	Filming with SGM contributors (see Findings section 9) Development work by appointed	Feedback from adult expert interviews (Lucassen et al., in prep.)

and parents (see sub- section ii. below)	sub-section ii.) Team co- development to finalise decisions and solutions (see Findings section 5)	solutions (see v.)	members through specialist media and modelling agencies (see vii.)	digital provider (see Findings section 10)
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Ethical Considerations

Ethical approval for the aspects of the study involving human participation was granted by The Open University's Human Research Ethics Committee before data collection began (ethical approval reference: HREC/4059/Lucassen). All participants, both adults (e.g., professionals who directly support SGMY) and adolescents gave full informed consent to participate and signed a consent form to indicate this. Young people under the age of 16 years also required written parental consent to participate. Study data were anonymised prior to analysis and all consent records stored separately to the data. Following anonymisation of interview and focus group transcripts, recordings and transcripts with person-identifiable information were deleted. Where applicable participants were reimbursed for any transport costs associated with participation and given a £20 gift voucher per interview or focus group as a token of gratitude for their involvement.

i. Systematic scoping review – (IDENTIFY and DEFINE stages)

The PRISMA extension for scoping reviews guidelines [22] were followed and studies were included if they contained primary data on psycho-social coping strategies for SGMY, were conducted with adolescents (aged 10-19 years) and were published in English. MEDLINE, Embase and PsycINFO databases were searched. Search terms included a range of terms to capture a sexual and gender minority focus (e.g., gender minorit*; LGB*) and a range of terms for psycho-social coping strategies (e.g., Coping*; adaptive; resilience). No date restrictions were applied, and searches ran up to the 19th of January 2022. A descriptive approach to synthesising the evidence, as recommended by Arksey and O'Malley [23], was utilised. The methods and findings of the scoping review has been published [14]. The systematic scoping review ran in parallel to the focus groups with SGMY and interviews with adult experts and parents, which are reported below.

ii. Interviews and focus groups with SGMY, adult experts and parents - (IDENTIFY and DEFINE stages)

Six focus groups, each with between three and ten SGMY participants, were conducted between November 2021 and February 2022. To reach and recruit participants in the applicable age range from the target communities, we worked with three organisations supporting LGBTQ+ youth to advertise the opportunity. Focus groups were run in conjunction with these organisations with their staff also attending to help young people feel comfortable and

supported. Staff also assisted the process of gaining informed consent from SGMY, and for those under 16 years, their parents or guardians. Due to COVID-19 restrictions all focus groups were hosted via videoconference. Sessions were audio recorded and transcribed. Once accurate transcripts were approved (by ML or ANG) and fully anonymised, focus group electronic audio recordings were deleted. Participants were all secondary school aged, primarily between the ages of 12 and 19 years old, with those 15 years and younger in a separate focus group. Four participants up to the age of 25 years old took part in the older groups, because they had special educational needs (e.g., learning disabilities), and as such were still engaged in secondary-level education or training. Table 2 below provides demographic information about SGMY focus group participants, 29 (80.6%) of the SGMY were gender minority youth (i.e., their gender identity was not the same as their sex as recorded at birth). Many (38.9%) of the participants were bisexual or pansexual. Approximately one-in-five SGMY were from a dual heritage (e.g., German and Nigerian) or were from a migrant background (e.g., the other White participants who were not White British).

In parallel, sixteen one-to-one interviews were conducted with adult experts, based in England, with one participant in Wales, including parents of SGMY, between October 2021 and January 2022. Four adults held posts as commissioners of public health services relevant to sexual health and wellbeing, roles which included consideration of the needs of SGMY. Four of the experts worked in frontline practitioner roles supporting the health and wellbeing of young people, including SGMY (e.g., clinicians working in child and adolescent mental health services). Four experts were community-based professionals, such as SGMY youth workers and policing staff focused on reducing the mistreatment of SGM individuals. Four of the adults were parents of a SGMY adolescent interested in better supporting SGMY. As with SGMY focus groups, interviews were conducted using videoconference software, were audio recorded and transcripts of interviews produced. Once anonymised and approved as accurate (by ML or ANG), electronic audio recordings were deleted.

Table 2. Table showing demographic information about Sexual and Gender Minority Youth (SGMY) involved in focus groups about factors affecting mental wellbeing between November 2021 and January 2022 in England

<i>Total number of focus groups</i>	6 focus groups (with between 5 and 11 participants)	
<i>Total number of attendees</i>	44 participants (including 8 youth workers)	
<i>Total number of young people/SGMY</i>	36	
<i>Age of SGMY</i>	Range = 12 to 24 years, Mean = 16.8 years	
<i>Gender of SGMY^a</i>	Non-binary	10 (27.8%)
	Male	5 (13.9%)
	Female	5 (13.9%)
	Trans man/male/masc	5 (13.9%)
	Questioning	2 (5.6%)
	Other responses (e.g., gender fluid)	9 (25.0%)
<i>Is your gender identity the same as your sex recorded at birth?</i>	No=29 (80.6%)	
<i>Sexuality of SGMY</i>	Bisexual	9 (25.0%)
	Pansexual	5 (13.9%)
	Gay	5 (13.9%)
	Queer	2 (5.6%)

	Questioning	2 (5.6%)
	Lesbian	1 (2.8%)
	Not heterosexual	1 (2.8%)
	"Unlabeled"	1 (2.8%)
	"N/A" (i.e., not applicable)	1 (2.8%)
	Two responses (e.g., bisexual & queer)	4 (11.1%)
	Three or more responses (e.g., bisexual, pansexual, not heterosexual)	5 (13.9%)
<i>Ethnicity of SGMY</i>	White British	25 (69.4%)
	Other White	3 (8.3%)
	British	3 (8.3%)
	Mixed	1 (2.8%)
	British Moroccan	1 (2.8%)
	German and Nigerian	1 (2.8%)
	Portuguese	1 (2.8%)
	Not stated	1 (2.8%)
<hr/>		
<i>Have you ever suffered from feeling down or low for more than a few days in a row?</i>		Yes=31 (86.1%)

^a This item was an open-ended question, as such three gender minority youth wrote Male or Female (i.e. Male and Female here does not necessarily equate to being cisgender and Male or Female).

iii. Appointment of digital developer (Preparation for delivering CONCEPT, CREATE, USE stages)

In January 2022 a tender specification for a digital developer was created based on the outcomes at that time from the IDENTIFY, DEFINE and POSITION work outlined above (see Supplementary file A for details). A range of commercial developers were notified about the tender, and after a competitive process involving an assessment of providers' submissions and online interviews, Bluestep Solutions (Bluestep for brevity) were appointed. They supported the research team in the task of translating the findings that emerged from the preceding evidence-gathering stages (i.e., the scoping review, interviews and focus groups) into content for the digital resource. Bluestep's expertise resided in developing engaging and user-friendly content aligned to the research team's evidence-informed approach. Co-design workshops with SGMY participants were conducted to refine the pilot content and improve its look and feel (described below in Section 3.4). Bluestep provided a map of the potential structure and parameters of the digital resource which would be possible to develop within the available budget. The original budget was £41,000 (circa US\$50,000). Some savings were made to the project's overall budget and additional funds were also sourced through The Open University, providing a final budget of nearly £50,000 (circa US\$61,000). To remain within budget, Bluestep indicated that the research team should focus on three core sections of content and have only one full day of filming.

iv. Initial co-design workshops with SGMY and email/online consultations – (POSITION and CONCEPT stages)

Two initial co-design workshops were held with a) Older SGMY aged 16 years plus (May 2022) and b) Younger SGMY aged 12-15 years (June 2022). The main aim of these workshops was to identify the priority issues and challenges faced by SGMY on which to focus, and the preferred solutions and strategies that should be highlighted. To achieve this, ten possible topics/issues

and eleven possible solutions/strategies were presented to them based on data from the scoping review, and the earlier interviews with adults, and focus groups with SGMY. A modified nominal group technique (NGT) [24] was used to facilitate this process. This involved structured voting prior to group discussions around the possible topics for inclusion, where all attendees were given an opportunity to express their views and preferences.

In June 2022, Bluestep created a selection of visual concepts (Multimedia appendix A) with different colour palettes and visual ‘tones of voice’ represented with imagery. For example, the ‘inclusive’ visualised toolkit included a bright rainbow colour palette, and the message toning was intended to represent inclusivity and messaging that ‘we’re all in it together’. The overall concepts were also set out alongside some suggested names (created from a marketing perspective) from Bluestep for the digital resource. The suggested names, which drew on commercial marketing expertise from Bluestep, included:

1 MEE: Mindful Education & Enlightenment for LGBTQ+

2. Oneself: Defined by you, allied by us

3. Free to be: Mindful tools for your journey

These visual concepts and suggested names were shared with our SGMY workshop participants, and they gave their feedback with support from youth workers via email, and in an online consultation session by videoconference. The ultimate decisions about concepts, colour schemes and names were strongly informed by the SGMY views and were led by their preferences. A set of questions to prompt discussions around preferences were provided to the youth workers supporting the consultation process.

v. Research team co-development to finalise decisions on the focus and topic areas (DEFINE, POSITION & CONCEPT stages)

Following the second SGMY co-design workshop, the research team met to reflect on the voting decisions of SGMY, and to discuss their own ideas for the priority content and sections in the resource and its features (e.g., video clips and animations) of the resource. As well as professional expertise, members of the team also have lived experience from their personal lives on which to draw (e.g., ML is a white migrant, queer male and a gender role non-conformer; RS is from an ethnic minority and has lived experience of mental illness (see [25]); KB is White British, grew up with a sibling who identifies as a gay cisgender male and has lived experience of mental illness). The team held two meetings in June 2022, one week apart.

vi. Questionnaire to assess the ‘look and feel’ of the design options – (CONCEPT stage)

Parallel to the co-design and development work outlined above, Bluestep produced a number of design concepts for consideration by our SGMY workshop attendees and the research team. A questionnaire was developed which asked SGMY workshop attendees to consider the designs and some other key features related to look and feel of the resource, such as whether the ‘characters’ featured should be real people or fully animated or if the ‘characters’ should be acting out scenarios versus sharing their own personal experiences as a SGM individual (see Supplementary file B).

vii. Appointment of SGM contributors through specialist media and modelling agencies - (CONCEPT stage)

Based on our understanding of the need for ‘credible sources’ to deliver messages in our intervention, and because the dramatizations we had initially envisaged for *Oneself* in our original study protocol were deemed as being too contrived and artificial by SGMY, we made a notable decision. In particular, it was identified that real SGM young adults, who can talk authentically about their own experiences growing up as SGMY, would be an important feature of *Oneself*. In July 2022 the process of recruiting three SGM young adult contributors or community members was initiated. We applied to modelling and talent agencies, given that we wanted contributors comfortable in front of cameras. We were provided with a dozen portfolios of different potential SGM contributors and short video introductory clips about why they were interested in being involved in the development of *Oneself*. The research team and SGMY considered the clips separately, and SGMY voted on their preferred SGM contributors/community members. Feedback about the initial possible contributors highlighted that there was a lack of diversity, particularly around ethnicity and body size (i.e., they looked ‘too much like models’). In our attempts to ensure broader representation, we went back a second time to the agencies to get further potential contributor options.

viii. Further co-design workshops with SGMY – (CREATE stage)

Two further co-design workshops were held in September 2022 and January 2023. Codesign workshops were hosted in-person, with ML, Bluestep and/or ANG present. Audio-recordings were transcribed, and once accurate transcripts were approved (by ML or ANG) and fully anonymised, co-design workshops audio recordings were deleted. Participants were all secondary school aged, primarily between the ages of 12 and 19 years old, with those 15 years and younger in a separate workshop. Demographic information about workshop participants is set out in table 3 below. Fourteen of the 15 participants (93.3%) were gender minority youth (i.e., their gender identity was not the same as their sex as recorded at birth) and 60% were bisexual or pansexual. Approximately one quarter of SGMY (26.6%) were from a dual heritage (e.g., Asian and Black) or were from a migrant background (e.g., White participants who were not White British). An in-person consultation also bridged codesign workshops 3 and 4. This was not recorded.

Table 3. Table showing demographic information about Sexual and Gender Minority Youth (SGMY) interested in supporting the mental wellbeing of SGMY involved in *Oneself* codesign workshops between May 2022 and January 2023 in England

<i>Total number of workshops</i>	4 co-design workshops (with between 5 and 8 youth participants)	
<i>Total number of attendees</i>	19 participants (including 4 youth workers)	
<i>Total number of young people/SGMY</i>	15	
<i>Age of SGMY</i>	Range = 12 to 20 years, Mean = 15.73 years	
<i>Gender of SGMY</i>	Non-binary	5 (33.3%)
	Genderfluid	3 (20.0%)
	Other responses (e.g., agender & demigirl)	2 (13.3%)

	Trans man/male/masc	2 (13.3%)
	Male or boy	2 (13.3%)
	"No idea"	1 (6.7%)
<hr/>		
<i>Is your gender identity the same as your sex recorded at birth?</i>	No=14 (93.3%)	
<hr/>		
<i>Sexuality of SGMY</i>	Bisexual	6 (40.0%)
	Pansexual	3 (20.0%)
	Questioning	1 (6.7%)
	Omnisexual	1 (6.7%)
	Not heterosexual	1 (6.7%)
	Abrosexual	1 (6.7%)
	"Don't know"	1 (6.7%)
	Left blank/no response	1 (6.7%)
<hr/>		
<i>Ethnicity of SGMY</i>	White British	10 (66.7%)
	White	2 (13.3%)
	Mixed (e.g., Asian and Black)	2 (13.3%)
	British	1 (6.7%)
<hr/>		
<i>Have you ever suffered from feeling down or low mood for more than a few days in a row?</i>	Yes=13 (86.7%)	
<hr/>		

Findings

1. Results from the systematic scoping review – (IDENTIFY and DEFINE stages)

The findings of the scoping review have been published previously [14], however a summary is presented here about what we learnt that fed into our thinking about the content for *Oneself*. A total of 68 articles were identified as meeting the review criteria. The oldest paper dated from 2008 and more than half were published from 2017 onwards. Most studies were small-scale (i.e., with fewer than 50 participants), and more than two-thirds were conducted in the USA. Twenty-six studies had included sexual minority youths only; a further 28 included sexual and gender minority young people and 14 studies included only gender minority young people.

Twenty-four of the included articles focussed on 17 unique interventions to support SGMY. More than half of the intervention papers (n=13 studies) focused on both sexual and gender minority youth. Nine studies included only sexual minority young people and two studies focussed on gender minority youth only. Of the 17 interventions, the most frequently cited therapeutic modality was cognitive behavioural therapy (CBT) (n=11 studies/6 interventions). Common features described in these interventions, including those from CBT-based interventions, are summarised in table 4 below.

Most of the interventions involved in-person delivery (n= 14 studies). Five (from 9 studies) were delivered in a digital format. In addition to the strategies and techniques outlined in table 4 below, it was also noted that interventions often sought to affirm SGMY identities and give a message of hope to intervention users (e.g., "I won't always feel this way" in the Rainbow SPARX intervention [26]).

Forty-four of the included studies did not focus on interventions per se. Instead, they were mainly qualitative studies (with some mixed methods studies combining survey and qualitative data) that explored the experiences of SGMY, and the strategies they used to cope with the

challenges they face. Table 5 summarises the commonly identified strategies and tools for SGMY, drawn from these studies and applied to *Oneself*.

Table 4. Table summarising common techniques identified internationally from existing interventions (ranked by frequency) to support co-design processes in the current project for Sexual and Gender Minority Youth (SGMY) and their mental wellbeing, from a systematic scoping review published elsewhere in 2022 [14]

Technique or coping strategy	Number of interventions that included it	Explanation of technique	How this was applied in Oneself
Peer support for SGMYs	7	Providing a format or space for peer-to-peer support	Six relevant 'Additional Resources' (all online) provided (e.g., LGBT Switchboard)
Cognitive restructuring	6	E.g., Use of the ABCD technique: Involves considering an activating event and the negative belief or thought that may accompany that, considering the consequence of that thought or belief and then actively disputing any negative beliefs or thoughts to restructure the thinking around it	ABCD downloadable resource (entitled 'Rejecting the Negativity') included in the 'Dealing with School' section
Problem solving	5	Providing a structured way of thinking about problems and possible solutions	Problem solving using 'STEPS' included in the 'Dealing with Parents and Families' section. First-hand experiences of problems and solutions provided by SGM contributors
Behavioural activity/activation	4	Promoting activity that improves mental wellbeing because the activity is pleasant to do e.g., dancing and singing	Provided as self-care tips under 'Additional Resources' in the 'Chilling Out' section
Recognising problematic cognitions	4	Support to recognise own negative thinking patterns in response to environment or others' actions	ABCD downloadable resource (entitled 'Rejecting the Negativity') included in the 'Dealing with School' section
Relaxation exercises	3	These include activities like breathing exercises and	Three relaxation exercises included in

		progressive muscle relaxation techniques	the 'Chilling Out' section
Enhancing social or environmental support	3	Supporting the person to take positive action towards building a supportive social network	'Finding Allies' activities under the 'Dealing with School' section
Psycho-education	3	Education about link between environmental stressors and wellbeing, and between own thinking and behaviour on emotional wellbeing	Quotes from SGMY used across Oneself and first-hand accounts from SGM contributors (audio visual content)
Building family relationships	2	Supporting family members to improve communication skills to enhance relationships	'Standing Up for Yourself' – exercise on how to best get your point across, under 'Dealing with Parents and Families' section
Educating families	2	Educating family members to help them to improve their attitudes and behaviours with their SGMY children/siblings	Quotes from SGMY e.g., "Know that it's a lack of understanding rather than a lack of love."
Raising awareness of resources	2	Identifying others sources of information and support that are available	Six relevant 'Additional Resources' (all online) provided (e.g., LGBT Switchboard)
Public narratives	2	Sharing of stories such as 'coming out' stories to help promote and make part of public discourse	The 'Coming Out' section includes first-hand accounts from SGM contributors (audio visual content)

Table 5. Table summarising common strategies identified internationally to support co-design processes in the current project for Sexual and Gender Minority Youth (SGMY) mental wellbeing (ranked by frequency), from a systematic scoping review published elsewhere in 2022 [14]

Strategy or tool	Number of studies that identified it	Explanation
Internet is an important tool to achieve connection with other SGMY	8	Internet seen as 'life saving'
Social support and connection with other SGMY	6	Need to meet people 'like me'

Taking on a peer educator or political advocacy role	5	Taking on an empowering role like that of an educator or advocate was seen as valuable
Mentoring or providing support to other SGMY	4	Mentoring was also seen as useful and had the ability to build SGMY social networks
Escaping challenging environments and creating 'pockets of safety'	4	SGMY could not easily leave unsupportive environments, but could potentially enhance their safety
Cognitive strategies to manage negative messages (such as the cognitive restructuring exercise/ABCD in table 3 above)	4	CBT techniques designed to enhance the mental wellbeing of SGMY
Choosing when to be 'out' versus 'learning to hide' as adaptive strategies to manage wellbeing	4	Not coming out can be necessary to stay safe, but choosing to come out to the right people increases access to social support
Self-harming (not considered)	4	Although not recommended as a coping strategy, it was discussed in this way by some SGMY
Distraction techniques to take mind away from worries and/or improve mental wellbeing	3	This included using social media, gaming, watching online media and getting exercise outdoors
Other risky coping strategies: e.g., suicide attempts, risky sex, drug taking and alcohol consumption (not considered)	3	Although not recommended coping strategies, they were discussed in this way by some SGMY
Use of mindfulness, emotional regulation strategies, cognitive reappraisals, assertive communication techniques and resisting rigid cultural boundaries	3	Strategies that are frequently part of CBT-based interventions
The internet can be a problematic space and can lead to exposure to mistreatment online – SGMY need to be skilled users to protect themselves	3	SGMY can be excluded online or subject to abuse, so managing safety with privacy setting or blocking abusers is necessary
Avoidance strategies – physically and emotionally	2	Attempting to suppress certain emotions at times and/or physically walking away

Taken together, the strategies listed in tables 4 and 5 gave us a comprehensive list of potential contenders to make up the core content and features of *Oneself*. We drew on this information, and the findings we present next, from our focus groups and interviews, to develop the content around the three topic areas identified as most important.

2. Results of interviews and focus groups with SGMY, adult experts and parents – (IDENTIFY and DEFINE stages)

To expedite drawing out the relevant data from the focus group and interview transcripts, in order to inform *Oneself's* development, the data were divided between the research team, and examined carefully. Detailed notes were made about the sorts of issues the various stakeholders

identified as important to address. Details given on strategies and tools that were deemed useful in participants' experiences were also extracted. Issues and strategies identified were revised during two team meetings in June 2022. A more detailed framework analysis [27] of the data is underway and will be published in due course.

Table 6. The main topic areas identified as a priority for Sexual and Gender Minority Youth (SGMY) mental wellbeing during co-design (in descending order of importance based on SGMY ratings) in England (2022)

How to deal with unsupportive parents or other family members
How to deal with bullying at school (e.g., name calling)
How to deal with the challenges associated with coming out
How to deal with negativity directed at LGBTQ+ people (e.g., from a religion)
How to deal with misgendering
How to deal with feeling isolated and/or alone
How to deal with stigma (e.g., homo-, bi- and/or trans-phobia)
How to deal with online abuse (e.g., trolls saying nasty things)
How to explore and make sense of your sexuality and/or gender
How to deal with people not believing you about your sexuality and/or gender

Table 7. The potential toolkit focus area or populations identified as a priority for Sexual and Gender Minority Youth (SGMY) mental wellbeing during co-design (in descending order of importance based on SGMY ratings) in England (2022)

Educates teachers and others about how to better support LGBTQ+ youth – so school environments can be improved for LGBTQ+ youth
Educates parents (and other people in the community) about how to better support LGBTQ+ youth – so communities can be improved for LGBTQ+ youth
Helps young people with practical issues – in particular finding a toilet they can safely use
Allows the young person to connect directly with other LGBTQ+ young people – so they can talk to someone else who understands
Coming out and how to do this safely – highlights that it is okay not to come out (and it is also okay to change your mind)
Up-to-date and accurate information on sexuality and gender – to help them make sense of their identity
How to find supportive people online – so they have a better support network
Help young people figure out what they can and can't change themselves – so they know what to focus their energy on
Uses affirmations (positive messages) about the young person (e.g., "I deserve kindness" and "my gender is not an inconvenience") to help people feel even better about themselves
Helps young people to engage in creative activities (e.g., art and music) to make them feel better
Provide the contact phone numbers and details for supports available to LGBTQ+ youth – so they know where to go for extra help

The rapid data extraction process provided us with a series of initial issues and potential areas or populations of focus. ML and ANG then met to construct a longlist of the main issues (n=10) and the potential solutions/strategies (n=11) that had emerged from the findings of the scoping review and the interviews and focus groups with stakeholders. These are summarised in tables 6 and 7 above.

3. First proposed structure and designs after appointing the digital developer – (in preparation for CONCEPT, CREATE, USE stages)

Bluestep provided a map of the potential structure and parameters of the digital resource that it would be possible to develop for the available budget, specifically a wireframe. A copy of the structure is provided in multimedia appendix B. This illustrates the inclusion of three core features/sections of content, and a 'free' (all content is free to access but the main content requires the user to create an account with a username/email address and password)¹-taster section of content proposed as important to engage potential users and educate the wider public (e.g., teachers).

4. Findings from the co-design workshops with SGMY – (POSITION and CONCEPT stages)

Figure 1 below shows the average rank order preferences from the adapted nominal group technique voting in relation to priority issues or topics to cover within the *Oneself* resource. Participants ranked their highest priority topic as rank 1 and their lowest priority topic as 10. The lower average rank order identifies the highest preference amongst the group. Dealing with unsupportive parents or other family members and dealing with bullying were the highest ranked topics to cover. Figure 2 below presents the average rank order preferences for possible solutions or strategies to include within *Oneself*. The highest-ranking content included educating parents and teachers to help to improve the quality of the environments they live in.

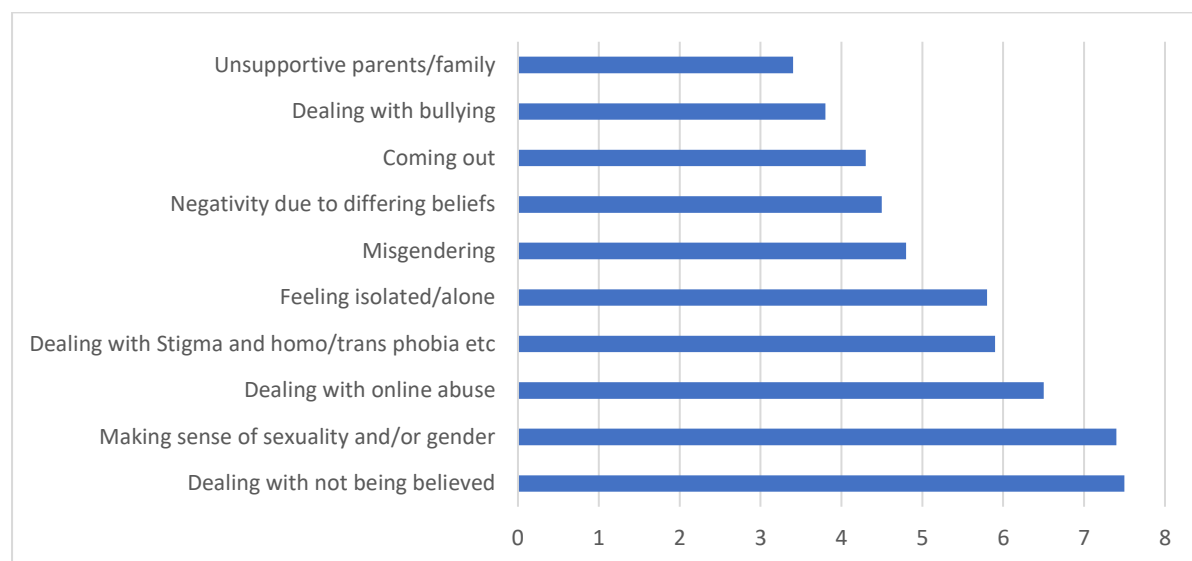


Figure 1. Bar chart showing average Sexual and Gender Minority Youth (SGMY) rank order preferences of topics to cover in relation to SGMY mental wellbeing for co-design purposes in England (June 2022) - ordered highest to lowest priority

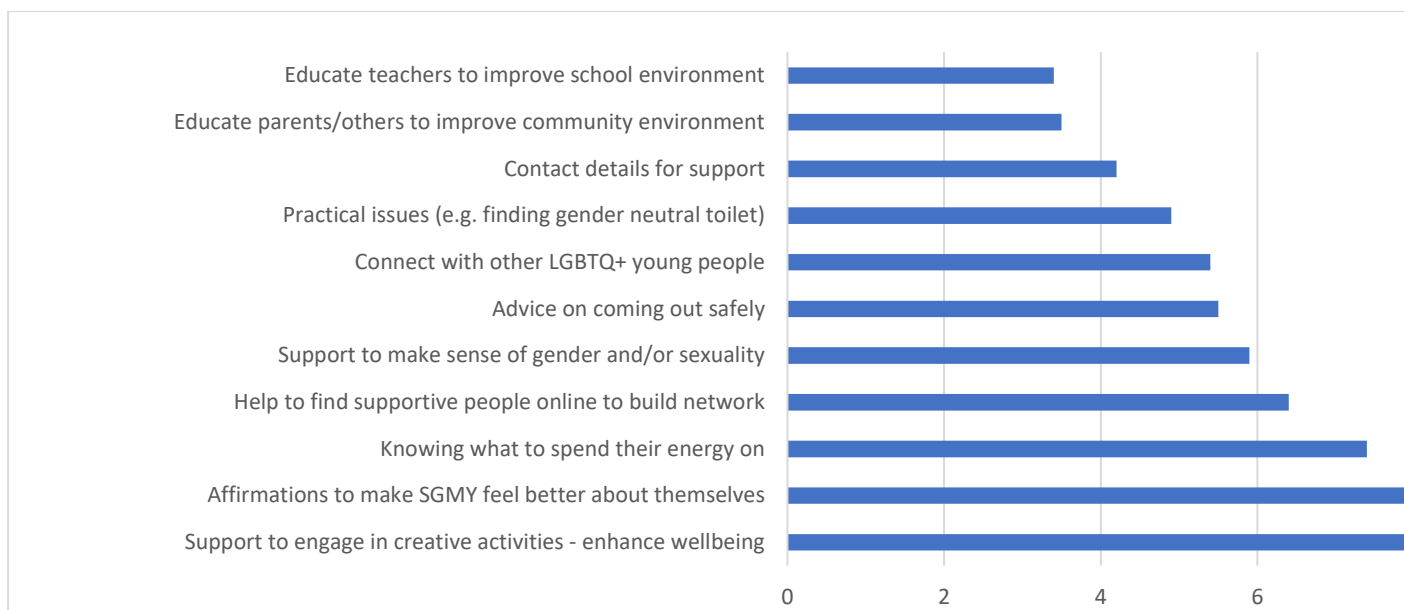


Figure 2 Bar chart showing average Sexual and Gender Minority Youth (SGMY) rank order preferences of potential solutions/strategies in relation to SGMY mental wellbeing for co-design purposes in England (June 2022) – ordered highest to lowest priority

5. Findings from research team’s codesign meetings in June 2022 – (DESIGN, POSITION & CONCEPT stages)

The first co-design meeting with the research team began by reflecting on the rank order preferences of the SGMY (presented above). It was acknowledged that although clear priorities emerged from the data there was also considerable variability in the rank order preferences. With the budget and practical limits to the amount of content we could include, we could not create an ideal resource to suit all SGMY needs. However, given the identification by Bluestep that we could have three main sections with featured content, the selection of the top three topic areas was straightforward: one on each of 1. coming out and doing so safely, 2. managing school, including homophobic, biphobic or transphobic bullying or similar, and 3. dealing with parents and families, especially unsupportive family members, including parents/caregivers. We found the favoured focus area or population being about educating parents, teachers and other community members outside the scope given our budget to date, and since the resource was always intended to be primarily for SGMY themselves, rather than adults who support SGMY. The resource is designed to centre the experiences of SGMY, but we expect that *Oneself* will ultimately support parents, teachers and other community members through increasing awareness and the visibility of SGMY experiences. We do acknowledge there are important challenges in balancing (individual-focused) support for SGMY with promoting social justice through education of adult stakeholders. As was done in the present study, it is important to consider these elements in parallel because they are interactive. While we decided not to explicitly target adults at this stage, we acknowledged this request as being part of SGMY desire for the environments they live in to be better for them and more supportive of them. Hence, the decision to prioritise the educational animation about pronouns, intended for a wider audience (including parents and teachers). We also reflected that whilst the main purpose of the content should be to help young people cope with situations independently, it could be useful for educating parents, teachers and other members of the community. Specifically, the resource could help them understand the unique challenges of growing up as a SGMY and how they can act and respond supportively in order to promote positive social change. At this stage we thought that the formats we might use to present content were videos or animations depicting

narratives of SGMY everyday experiences, possibly with some interactive content or features for the user.

SGMY understandably had a range of perspectives and ideas about what should be covered in *Oneself*. We identified nine such specific suggestions. For instance, we were cautioned against educating *Oneself* users about the various sexuality and gender 'labels' used by a young person, given the terminology is continually evolving (and frequently contested). Another SGMY felt strongly that we acknowledged the difficulties associated with challenging environments, for example 'you cannot change everyone' and therefore a SGMY must know how (and when) to 'walk away'. They also wanted us to ensure that our SGM contributors would represent as much diversity as possible. By the end of the research team discussions there was a growing sense that we could cover, to some degree, many of the preferred solutions/strategies that had been discussed and voted on by SGMY in their codesign workshops, with a focus on the top three topics/issues.

It was beyond the scope and resources of *Oneself* to provide an online community space where SGMY could connect with each other safely in real-time, as this would likely need constant monitoring and on-going administration. However, advice on where or how to do this elsewhere could be included, along with links to other supportive resources. It was decided the resource would focus on supporting SGMY directly. We aimed to centre the young person in this resource, with *Oneself* often talking directly to them, and trying to focus the resource on them and their needs, for instance by using language/terms and concepts that map on to the concerns they have raised with us as the research team. This act of centring is in direct contrast to the marginalisation that they may face daily. It was also intended to have a dual purpose of potentially serving to educate the wider community, including parents and teachers. It was felt that because the three main topics were focussed on dealing with challenges that can have a detrimental effect on wellbeing, the resource needed to include evidence-based tools and resources known to support and enhance mental wellbeing, such as relaxation techniques and other relevant means of coping. It also needed to include content that felt empowering of developing and evolving identities, to support and develop users' self-esteem.

6. Findings from the questionnaire to assess the 'look and feel' design options – (CONCEPT stage)

The wireframe structure of *Oneself* (which was designed to include some introductory content) was confirmed first. This included a log-in feature to access the three main content sections and access to recommended additional resources and sources of help and support. The log-in feature, with the associated gathering of demographic data, was deemed necessary to capture future usage information related to *Oneself*. Next Bluestep worked with the research team to develop a questionnaire posing different design concepts and options for the look and feel of the resource. The full questionnaire and options posed are presented in multimedia appendix C. A summary of the preferences that this process helped to identify is briefly summarised below.

Although the idea of having full animations with voice actors was rated favourably by many SGMY participants, a clear overall preference emerged for using real people talking about their first-hand experiences growing up as a SGMY, as well as the inclusion of SGMY 'influencers' or public figures. There were also clear indications that the resource would most likely be accessed on a smartphone by SGMY, that video clips should include audio-subtitles (to enable viewing without sound on; but this is also valuable for accessibility reasons), most indicated they would use headphones to listen to content too. Based on SGMY feedback, video-based content should ideally not exceed 60 seconds; some were willing to watch longer clips, when the content was engaging. Downloadable information sheets, for access again when offline were identified as

useful and SGMY participants favoured a colour palette which was pastel and informed by the 'progress rainbow flag'.

7. Team consultation based on the questionnaire feedback led to plans for inclusion of SGM contributors – (CONCEPT and CREATE stages)

The feedback we had had about the inclusion of SGM contributors (i.e., not actors playing a role) led to further consultation about the format of the resource and a decision to focus the main content on testimonial/account footage from SGM young adults, who could reflect on their experiences of the topics selected when they were growing up. We set about identifying individuals from modelling and talent agencies who would be willing to provide this kind of content as described in section 3.7.

The process of assessing potential SGM content contributors resulted in the appointment of three people who identify as being SGM who were willing to be involved for a set fee. Between them they represented diversity in terms of gender and sexual identity, body shape and size, abilities, and ethnicity. More detail about those selected is given in section 9 below.

8. Design concept selection via email and online consultation with SGMY and outcomes from co-design workshops 3 and 4 – (POSITION, CONCEPT and CREATE stages)

8.1 Design concept selection

Concept one (see figure 3) was a clear favourite in terms of the colour scheme and it was described as more 'friendly' and more inclusive than concept two (see figure 4). There was a question around the icons in both concepts (i.e., symbols transposed over certain images); SGMY did not feel the icons represented the topics adequately and therefore, wording/text would be needed, which would defeat the purpose of using icons. In concept one a 'share' function was seen as more understandable as it was interpreted as a speech bubble, though this could be made even clearer.

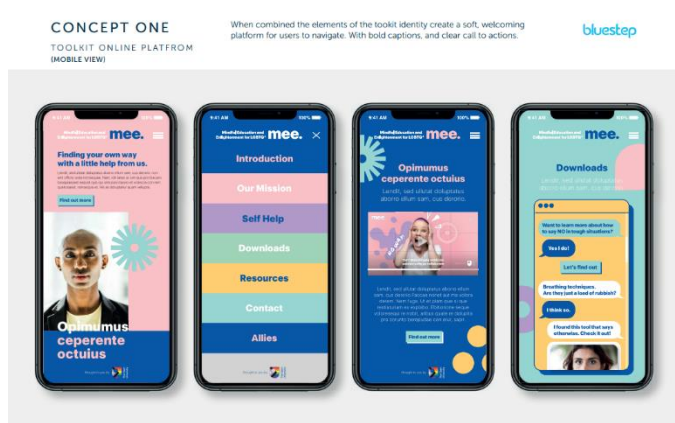


Figure 3. Concept one reviewed by Sexual and Gender Minority Youth (SGMY) interested in supporting SGMY mental wellbeing during co-design processes in England (2022).

From concept two SGMY liked the 'squiggly lines' in the designs if they could be incorporated into concept one's colour scheme. It was preferred that design elements from both concepts could be utilised in the final resource, though SGMY were clear not at the same time, as it would be too much on one image.

The SGMY participants were asked if they thought including The Open University (OU – lead university for the project) logo on the resource was a good idea. Most participants felt it would give people confidence in the quality of the resource as the OU is a well-known brand in the UK. The preferred name for the resource, of the three suggestions, was *Oneself* but they considered the inclusion of the originally proposed tag lines too long. Consequently, we did not use a subsequent lengthy tagline in combination with the name, *Oneself* across the whole resource.

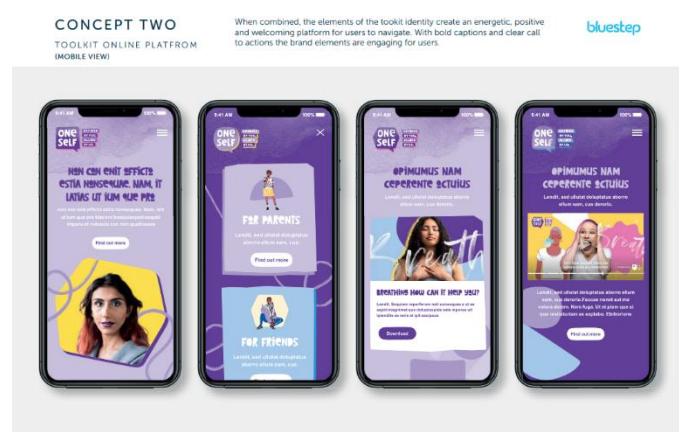


Figure 4 Concept two reviewed by Sexual and Gender Minority Youth (SGMY) interested in supporting SGMY mental wellbeing during co-design processes in England (2022).

Table 8 below provides a summary of the workshops and consultations, by date, including what was covered and how it aligns with the Hagen et al. co-design stages.

9. Introducing the SGM contributors – (CREATE stage)

Bluestep shortlisted ten candidate SGM young adult contributors for the research team, who in turn shortlisted five to present to the young people in codesign workshop 3. There were some unforeseen recruitment difficulties. For example, the selected gay man of colour

and a trans woman (who was one of SGMY's top choices), were unfortunately not able to participate as initially agreed. For instance, one person became concerned about how publicly accessible *Oneself* would be once released (i.e., they could be 'outed' to a whole range of people known to them). Thus, two female contributors were selected from the initial shortlist, both were rated very favourably by SGMY. As it was important for the project to reflect diversity, across gender identity, sexuality, race and disability, a further search for a third contributor was carried out during October. Finally, three contributors were selected and approved by the young people: Chloe, Lilly and Georgie.

Georgie, also known as Triple Minor, uses they/she/he pronouns and is trans non-binary. Georgie wanted to contribute to *Oneself* because they were keen to be the much-needed representation which is often lacking within our LGBTQ+ communities.

Lilly uses she/her pronouns and is pansexual. Lilly wanted to contribute to *Oneself* because when she was younger, she would have loved to have heard more about queer perspectives when growing up. That's why she wanted to talk about her own experiences.

Chloe uses she/her pronouns and is a lesbian. Chloe wanted to contribute to *Oneself* because she believes it is important for the younger LGBTQ+ community to feel supported and comfortable in their sexuality, and to be able to hear the voices and perspectives from queer people.

Table 8. A summary of the co-design workshops and consultation sessions in 2022 and 2023 in England that led to the creation of Oneself – a tool to support the mental wellbeing of Sexual and Gender Minority Youth (SGMY)

Phase	Timeline	Strategies or features chosen	Stage
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Codesign workshops 1 & 2 with SGMY	May-June 2022	Live video and animation combination (stylistic) Use of self-identified SGM contributors or influencers (format) Downloadable information sheets (format) Subtitles for all video clips (format)	Position Concept
Research team codesign meetings	June 2022	SGMY decide look and feel (stylistic) Prototype toolkit structured around 3 key features: dealing with parents and families, dealing with school and coming out (content) Contributors or community members, instead of actors and dramatizations (format)	Position Concept Create
IT development	June-December	First draft of look and feel (stylistic) Wireframes (structure)	Position Concept Create
Email consultations with SGMY	July-September 2022	Style and colour scheme confirmed (stylistic) Title/name (stylistic) Use of the OU logo confirmed (stylistic)	Create
Codesign workshop 3	September 2022	'Pearls of wisdom' and quotes from SGMY (content) Choosing the contributors: showreels (content) Choosing a brief tagline (to be used infrequently): 'supportive tools for your journey' (stylistic)	Create
In-person follow-up consultation session	October 2022	Feedback on refining the colours, images and design (stylistic), including initial drafting and then critiques of the pronouns animation script (content).	Create
Codesign workshop 4	January 2023	Pronouns animation storyboard approval (stylistic) Choosing key points and information from filmed material, and initial contributor clips (content)	Create

Bluestep developed and circulated a creative brief for the three SGM contributors, explaining the requirements for filming (see figures 5 and 6 below).



Figure 5. Creative briefing reviewed by Sexual and Gender Minority (SGM) contributors interested in supporting SGMY mental wellbeing during co-design processes in England (2022) (Part 1)



Figure 6. Creative briefing reviewed by Sexual and Gender Minority (SGM) contributors interested in supporting SGMY mental wellbeing during co-design processes in England (2022) (Part 2)

Filming took place on 29 November 2022 in a London-based studio. On the day, all three SGM contributors were asked the same questions around the topics of school, coming out, and

friends and family (Multimedia appendix D). Filming was done against a green screen so that animations could be added on later. Rough cut footage included around 35 minutes of footage of each of Chloe, Lilly, and Georgie and ten minutes of a group recording. ANG transcribed these rough cuts, which consisted of 28 pages in total, and summarised their content into key points and quotes that could be shared with the young people. These were given to SGMY in co-design workshop 4, who rated the points and quotes, adding their own reflections. For instance, SGMY found Lilly's advice to cope if someone reacts negatively to coming out helpful – she said 'Remember you are not alone. It may take time, but you'll find your community and people that get you and understand you'. However, SGMY found Georgie's advice for teachers and students to manage bullying at school (i.e., 'zero tolerance' for this) too vague as most schools should have zero tolerance policies, but there is still a need for proactiveness to enforce it. A summary of these points, organised by topic (coming out, school, and family and friends) and divided into challenges and solutions and strategies, with key quotes to include, was then given to Bluestep to create 2-3-minute-long rough cuts of each video, which combined live footage and animation. This made a total of six videos – Parents and Families: Some Common Challenges; Parents and Families: Some Strategies; School: Some Common Challenges; School: Some Strategies; Coming Out: Some Common Challenges; and Coming Out: Some Strategies. These were reviewed several times for content, design, storyline, accessibility, and subtitles, and finally approved by ML and ANG.

10. The Oneself Resource

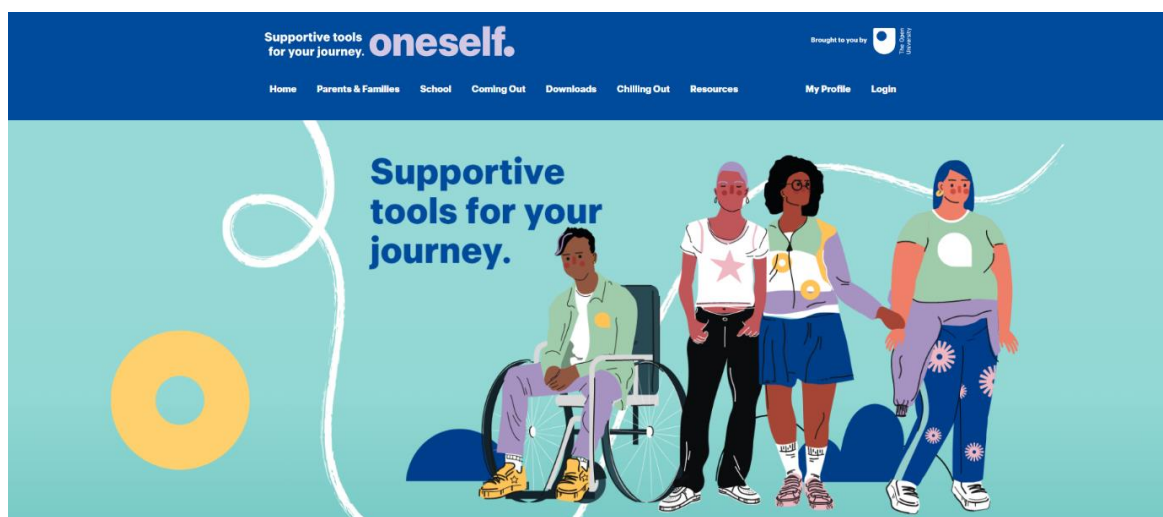


Figure 7. Part of the homepage for Oneself which was developed together with Sexual and Gender Minority Youth (SGMY) interested in supporting SGMY mental wellbeing during co-design processes in England (2022)

Oneself was divided into seven webpages: a homepage (see figure 7), the three topics of parents and families, school, and coming out; downloads, chilling out and resources. To access the whole toolkit, the user needs to log in, and complete a brief baseline measure of wellbeing (i.e., the WHO-5 Wellbeing Index). The homepage is free to access for anyone, although images of the contributors are reserved for the logged-in user.

The homepage includes a description of *Oneself*, quotes and extracts of what the user could find in the resource, for instance the three topics. These were designed to prompt the user to log in to access the content. The homepage also features an animation on the meaning and use of pronouns, created in collaboration with SGMY from Rainbow Power (a SGMY youth group) run by the Free2Be Alliance in England.

Each topic area began with two parts: 1) the problems and challenges that SGMY's face in relation to that topic; and 2) potential strategies and solutions to these issues. Each topic area included videos and social polls, which were then followed by activities, downloadable exercises, and external resources (see Multimedia appendix E for an example).

Each topic area had two live footage videos: the first video with SGM contributors talking about common challenges around the topic based on their own experiences; and the second video with SGM contributors talking about solutions, strategies and advice around the topic, based on their own experiences. Live footage was mixed with an animated background, highlighting what contributors were speaking about with colour, illustrations, or additional text.

Each topic area also had two social polls: The first social poll question asks users to reflect on their own experiences on the topic. For example, for Coming Out, this question was 'have you come out to others about your sexuality or gender yet?'. A second social poll question asks users to reflect on whose contributor's experience was most like their own. After answering, a percentage of responses to the question becomes visible to the user. This was designed so that the user could understand others' experiences and feel part of the *Oneself* community.

Two exercises or activities per topic area were designed to help the user reflect on the topic in greater depth and learn more about how to implement strategies and advice in managing challenges: For instance, an exercise in 'Parents & Families' is framed as 'Some LGBTQ+ young people have repeatedly described online

Your Reflections | Advice

Advice from LGBTQ+ youth consultants for Oneself about how to make sense of unsupportive parents includes: "Know that it's a lack of understanding rather than a lack of love".

Below is some advice from LGBTQ+ young people, pick one that you find helpful or enter your own in the text box below. Of note, you might choose a different approach for various people in your life.

- ☒ "Know that it's a lack of understanding rather than a lack of love"
- ☐ "Take it slow and easy; don't rush them and be calm about it. Once you get annoyed, they won't listen to you"
- ☐ "Cut them out!"
- ☐ "Don't let their opinions change who you are"
- ☐ "Find your community"
- ☐ "Tell a trusted adult and reach out to your community"
- ☐ "There is a family within the LGBTQ+ community you can access – You're allowed a chosen family"
- ☐ "Even though your parents are unsupportive, someone is, and is proud of you"
- ☐ "Find your network"

Your comments

Type here

Save

Figure 8. Example of a range of strategies presented after clicking 'explore more' which was developed together with Sexual and Gender Minority Youth (SGMY) interested in supporting SGMY mental wellbeing during co-design processes in England (2022)

environments as "lifesaving" at times. Reflect on your experiences of creating an online support network for yourself.'. This is followed by an 'Explore More' button that takes the user to another page where they can read through several strategies and choose the ones that fits them best (see Figure 8 above).

Downloads or downloadable exercises for each topic area were drafted by ML and ANG and then checked and refined by other research team members. Downloads were designed to tackle problems and challenges described in each of the topics: Two downloadable guides addressing issues relevant to each topic provide detailed written information on strategies and solutions around them. For Parents and Families these look at standing up for yourself (communication) and problem-solving. For School they focus on finding allies and rejecting the negativity (i.e., the ABCD method). For Coming Out, they support the coming out journey and finding hope. Downloads can also be found grouped together under the Downloads tab. An overview of the logic underpinning the development and content of Oneself is depicted in figure 9 below.

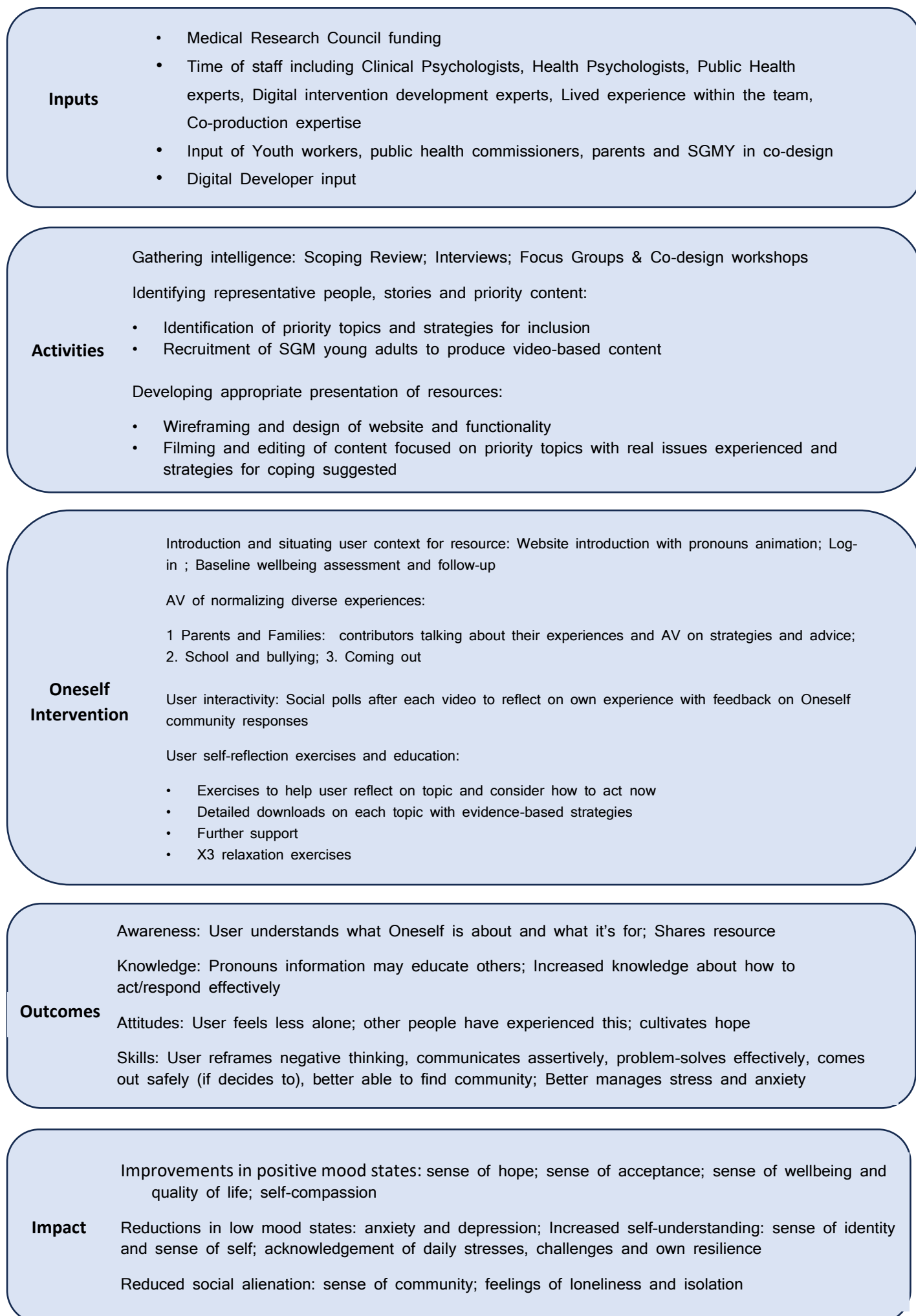


Figure 9 An overview of the co-design processes as these apply to the Oneself logic model as this pertains to Sexual and Gender Minority Youth (SGMY) mental wellbeing in England (2022)

Finally, each topic area provided two external resources leading to organisations and webpages that can offer SGMY further support, such as advice, community resources or helplines. These were chosen in agreement as a research team. External resources can also be found grouped together under the Resources tab.

All content was interspersed with quotes from our SGMY participants and the three SGM contributors, as well as short comments and advice linked to the social polls.

Finally, a Chilling Out section was included promoting relaxation exercises, as well as two additional external resources. These exercises consisted of three recordings, each one led by a SGM contributor following a script

provided by the research team (see figure 10). A stress scale of 1 to 10 was available to complete before and after listening to each recording, to help the user reflect upon whether it had been a useful and calming exercise for them. *Oneself* was designed so that users can rate content with between 1 and 5 stars as they work through it, providing the project with feedback.

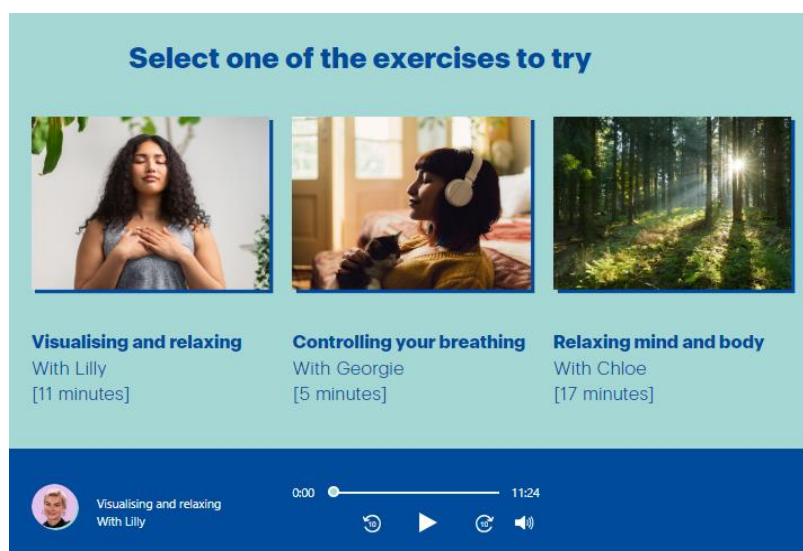


Figure 10. Screenshot of the relaxation exercises form the 'Chilling Out' section which was developed together with Sexual and Gender Minority Youth (SGMY) interested in supporting SGMY mental wellbeing during co-design processes in England (2022)

Discussion

This paper aimed to set out the systematic and iterative approach undertaken to develop an online resource to support the mental wellbeing of sexual and gender minority youth (SGMY), so they can deal effectively with the specific challenges of growing up LGBTQ+. Providing this kind of support was identified as important because SGMY are at greater risk of poor mental health outcomes than their cisgender and heterosexual peers[1][4][6][14]. The paper demonstrates how project activities are mapped against the six stages of co-design set out by Hagen et al. [13] . In particular, it shows how extant research evidence, and engagement with a range of stakeholders and representatives of end-users, were drawn on to make decisions about the content and design of the final resource, named *Oneself*. The logic underpinning the content of the resource is also set out to support the design of future process and outcome evaluations of *Oneself*. Initial usability and end-user feedback has been gathered through a set of 'think aloud' interviews and post-use reflection interviews with SGMY and adult stakeholders. Findings from this work are reported in detail elsewhere (Lucassen et al., in prep). The feedback to date has been largely positive with all SGMY testers saying they would be likely to recommend the resource to others. There have also been some points of constructive and critical feedback, in particular from adult stakeholders, which will need to be considered in future development work. For instance, that a greater range of experiences should be included, such as that of cisgender gay males and those from minority faith backgrounds.

Strengths and limitations of *Oneself*

There are several strengths and limitations of *Oneself* in its current format. Strengths include the fact that *Oneself* represents one of the first digital mental wellbeing-related resources reported upon which is designed specifically to meet the needs of SGMY. The design drew on the evidence base for techniques to support their wellbeing [14] and was developed in collaboration with four different stakeholder groups: SGMY, adults who work with SGMY, parents of SGMY and commissioners of public health services focussed on their needs. In doing so the process of development has included a wide variety of relevant perspectives and looked to build on what is already known about supporting the wellbeing of this population. It is also a strength of the resource that its development included adolescents under the age of 16 years and inclusive of gender and sexual minorities rather than focusing solely on gender minorities or sexual minorities. This is a departure from previous interventions which have typically focussed on those aged over 16 years only and selected to focus on either gender or sexual minorities[14]. Although there are important differences between sexual and gender minority experiences, there is also considerable overlap including on the impact on mental wellbeing. Some young people will ultimately identify as being both a sexual and a gender minority, which makes the resource's recognition of both minority groups important.

Limitations of the resource include the fact that given the budget constraints much of the available funding had to be channelled into creating basic initial functionality that would be likely to engage and sustain interest from the target end-user. This meant that much of the evidence-informed content that we might expect to have the greatest effect on mental health and wellbeing had to be included within the more text-heavy 'downloads' section. Although in early consultation work, SGMY had suggested these 'downloads' were a good way to provide additional resources for use off-line, it was later acknowledged that young people do not want to have to read a lot of text when engaging with the content (Lucassen et al., in prep). Common evidence-based features for supporting mental health and wellbeing include relaxation exercises [28], behavioural activation [29], problem solving [28][29][30], helping people to recognise problematic cognitions [26] and cognitive restructuring[26]. Future iterations will need to focus on bringing more of this content into the interactive elements of *Oneself*. In doing so however, it will also be important to consider whether such features are best delivered via pure self-help, or whether optimal delivery requires engagement with an adult who can help to structure what are often quite complex therapeutic activities (e.g., SGMY can feasibly be supported by 'e-coaches' to complete resources like *Oneself*).

SGMY involved in co-designing *Oneself* included almost one quarter who were dual heritage (e.g., German and Nigerian) or were from a migrant background (e.g., several of the White participants). Furthermore, gender minority youth, who have been traditionally under-represented in research pertaining to sexual minority youth[31], were very well represented, as were bisexual and pansexual participants. Nonetheless, content could have been improved in relation to intersectionality, such that there is the need to represent SGMY more complexly in terms of SGMY's social positions (e.g., across ethnicity, religion as well as social class). Future iterations need to look at making the resource more relatable to additional underrepresented groups as was suggested during co-design processes (e.g., for care experienced Asian SGMY from a minority faith background), who may face different and complex challenges growing up SGMY.

Self-help digital resources and interventions have the potential to be very cost effective [32]. They can be relatively low-cost to produce, with potential for very high reach, given evidence of increasing digital access and capability, particularly amongst young people [10][11]. Despite this, it is likely that those with the greatest vulnerabilities and at most risk of poor mental wellbeing may be the least likely to access suitable online spaces with ease (e.g., those with limited funds to purchase data for a mobile phone). Therefore, reaching those individuals needs to be carefully considered by those with responsibility for identifying and tackling such need, including youth support organisations, schools, and commissioners of services. In addition, digital resources like *Oneself* need to keep up with the rapid pace of progress and evolution in the online world. Young people have high expectations and are savvy consumers of online media, and they anticipate polished and engaging products. Keeping a resource like *Oneself* comprehensive, up-to-date, and relevant in terms of content and look and feel, requires ongoing funding. Relatedly, SGMY highlighted the importance of educating others, in particular teachers and parents, as this would bolster their overall mental wellbeing. In future funded work we would like to develop resources specifically for adults, potentially within the overall *Oneself* intervention. Lastly, something we identified that we would not be able to achieve with *Oneself*, at least for now, was direct access to support and interaction from a SGMY peer group. Although this was wanted, providing it would involve considerable resource to monitor and approve content and messaging, and avoid harm that could be caused by online bullying and harassment. Investigating how to provide this sense of community more fully in an online space warrants further attention. Ideally such spaces should be structured in a way in which the experiences of SGMY can be shared without any pressure to divulge information which could identify a young person or lead to instances of ‘over-sharing’ (which SGMY may regret at a later stage). Case studies, as presented in *Oneself* with the contributors, could offer a safe means by which to discuss personal issues without the need for self-disclosure. We think establishing and maintaining online community spaces in the context of digital mental health technologies requires further study, to ensure such spaces are both acceptable and viable. However, a noteworthy shortcoming of direct access to on-going human support and interaction, given the associated costs and practical considerations (e.g., whether an intervention can realistically be provided 24 hours per day seven days a week), are limitations in terms of an intervention’s likely reach.

Strengths and limitations of the research

The research we have conducted in developing *Oneself*, and this paper specifically, make an important contribution to needed literature which opens the ‘black box’ of intervention development [33]. Attempting to record the process of development including the co-design as accurately and comprehensively as possible and placing it within the public domain via open access publishing contributes to the Open Science agenda by making it accessible, inclusive and transparent [34]. Being explicit about the logic which underpins the intervention content, in terms of how it is intended to have an effect on factors associated with maintenance (or not) of mental wellbeing is also important to support the design of future evaluation studies [35].

Co-design work is complex and challenging to do well. We believe aspects of our co-design efforts were of merit, in particular our inclusion of younger SGMY (which included participants as young as 12-year-olds) and our engagement of SGMY from the ‘Identify’ all the way through to ‘Use’ stages of the process [13]. We drew heavily on SGMY’s views to decide on the topic areas to focus on and in deciding on the ‘look and feel’ of *Oneself*. We also made key changes to the resource in response to SGMY feedback, such as not using dramatizations, as was initially envisaged. Challenges to the co-design processes included the COVID-19 pandemic at the start of the project, which meant work with SGMY was conducted online, at a time when adolescents

were frequently fatigued by online forms of communication. Connected to this was our awareness that assisting in the creation of *Oneself* was one of the many demands placed on the SGMY involved in co-design, and as such we sought to use SGMY's time efficiently. Consequently, we limited the number of workshops conducted and we carried out some consultations via email, which was less robust. In the future we could enhance our co-design efforts and move closer to partnership (as opposed to consultation as defined by Arnstein in her ladder of participation see e.g. [36]) by helping a number of older SGMY to learn more about evidence-based techniques for supporting mental wellbeing and then subsequently getting them to design features of the content. These older adolescents could be employed as co-researchers, and they could draft and further develop content with our ongoing support.

A majority of the SGMY involved in the co-design of *Oneself* were gender minority young people, which is a strength, given these youth are underserved by mental health services[4]. However, a limitation of our research was that we struggled to recruit cisgender adolescents to join the co-design workshops and as such may have underrepresented the views or specific needs of certain youth (e.g., lesbian and gay cisgender youth). Relatedly, it is likely that some groups or individuals who may need intervention support the most are amongst those least likely to get involved in co-design or public involvement in research activities (e.g., SGMY who do not feel safe to 'come out') leading to intervention development and associated research more generally which misses the perspective of those who are 'not out'. Acknowledging this potential is important and striving to reach the underheard and underserved must remain a priority of future research.

Summary, conclusions and next steps

This paper aimed to set out the process involved in co-designing and developing *Oneself*, a digital resource to support SGMY build and maintain their resilience to cope with the everyday challenges of growing up LGBTQ+, and to support their mental health and wellbeing more generally. It is hoped that in the future the resource may be extended so that it is also of use for educating adults who wish to support SGMY. We have explained the included content, the logic which underpins its inclusion and acknowledged a range of strengths and limitations of what has been achieved so far. Priorities for future efforts will be to: specifically address critique and feedback provided by adults and from SGMY during their 'think aloud' interviews (Lucassen et al., in prep); build in additional features translating evidence-based content into interactive features; and, to continue to incorporate diverse voices in co-design, including consideration of how intersectionality may need to be more integrated. The next steps include applying for further research funding to continue our evaluation and development activities.

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Data availability: The qualitative data from our co-design work includes in-depth interviews and focus groups covering sensitive topics. Although identifying information was removed, full anonymised transcripts alongside participant demographic information may be identifiable to people who might know the participants. Hence there are ethical and privacy concerns relating to data sharing. However, data requests may be submitted to mat.lucassen@city.ac.uk for consideration in consultation with the wider *Oneself* project team.

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Conflicts of Interest

The authors are the co-developers of *Oneself*, but do not stand to gain financially from its future use and have no further conflicts of interest to declare.

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