



Trans and gender diverse young people's attitudes towards game-based digital mental health interventions: A qualitative investigation

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ABSTRACT

Background: Trans and gender diverse (TGD) young people are at high risk for mental health difficulties. Previous research has shown that three in four TGD young people have been diagnosed with an anxiety disorder and/or depression and almost one in two have attempted suicide. TGD young people experience barriers to traditional mental health services, commonly faced with inexperienced providers and discrimination. Video and computer games, as well as online spaces, are sources of resilience for TGD young people. Digital mental health interventions are a feasible, but understudied, approach to consider for this population.

Methods: $N = 14$ TGD young people aged 11–18 years were recruited to take part in focus groups as part of a multistage project. The focus groups were transcribed verbatim and analysed using a general inductive thematic analysis approach. This paper reports on their attitudes towards digital games and game-based digital mental health interventions.

Discussion: Aspects of game-based digital mental health interventions should be inclusive of diverse genders and sexuality, moderated appropriately and include content such as storylines and characters who are of diverse sexualities and/or gender. Participants were of the opinion that games should be preventative rather than treatment-focused; however, considering the high rate of mental health difficulties in this population, interventions should ideally address symptoms along the continuum from sub-clinical to clinical.

1. Introduction

Trans and gender diverse (TGD) people identify as a gender incongruent to the sex assigned to them at birth. There are a wide range of identities that TGD people identify as including male, female, non-binary, agender, genderqueer and bigender. A recent study from the United States suggests that TGD young people constitute 2.7% of the adolescent population (Rider et al., 2018).

1.1. The mental health of trans and gender diverse young people

Mental health difficulties commonly present during adolescent years in the general population (Merikangas et al., 2009; Kessler et al., 2007; Giedd et al., 2008). TGD young people are more likely than the

general population to experience difficulties such as harassment, bullying and discrimination in tandem with their gender identity formation, as well as associated negative reactions from those around them (Grossman and D'Augelli, 2006; Clark et al., 2014). For example, TGD young people often have to contend with issues regarding lack of access to appropriate facilities and support in schools and health services; the use of incorrect or insensitive terminology pertaining to their gender identity; and conflict regarding others' acceptance of their TGD identity (McDermott et al., 2016; Zeeman et al., 2017). They are also more likely than cisgender (people whose gender identity aligns with their sex assigned at birth) young people to lack family support and experience homelessness (Strauss et al., 2017).

These factors collectively heighten the risk for developing mental health difficulties in this population, aligning with Meyer's minority

Abbreviations: LGBT+, Lesbian, gay, bisexual, trans (transgender) and more diverse gender and sexualities; MMO, Massively multiplayer online; TGD, Trans and/or gender diverse

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stress theory which explains the process by which such negative events lead to the internalisation of stressors and the expectation of future rejection from society (Meyer, 2003). Depression has been diagnosed in 74.6% of TGD young Australians, 72.2% have been diagnosed with an anxiety disorder and 48.1% have attempted suicide in their lifetime (Strauss et al., 2019). Despite extraordinarily high risk, TGD young people often face unique barriers to accessing timely and appropriate mental health services, due to care providers lacking relevant knowledge and experience, transphobic clinicians and services and refusal of care (Strauss et al., 2017) as well as issues related to feeling unable to talk about gender and sexuality (McDermott et al., 2018). In addition, physical barriers to accessing treatment also exist for TGD young people who live in rural locations (Telfer et al., 2018). TGD young people may also be unwilling to access mental health services due to fear of stigma and discrimination from health professionals (Telfer et al., 2018). The cost of accessing mental health services also prevents some TGD young people from availing themselves of these services (Benson, 2013). In light of the high mental health burden of this population TGD populations need access to comprehensive and trans-competent care (Reisner et al., 2016). Accordingly, there is a clear need for interventions specifically tailored to TGD young people.

1.2. Digital mental health interventions

A potential solution to this disparity in health service accessibility and uptake is the development and delivery of digital mental health interventions for TGD young people (Perry et al., 2018). These interventions are attractive as a complement or alternative to traditional mental health services due to their potential for retaining consumer privacy at an affordable cost with convenient delivery. Tailored digital mental health interventions may be especially appropriate for TGD young people due to their experienced isolation, stigma and potential avoidance of traditional mental health services (Grossman and D'Augelli, 2007; Grossman and D'Augelli, 2006; Grossman et al., 2005; Toomey et al., 2010). Our research has shown that TGD young people who are isolated from services are more likely to report poor mental health (Strauss et al., 2019). In addition, TGD young people are known to turn to digital outlets (e.g., video and computer games, social media) to make themselves feel better (Strauss et al., 2017). This finding is consistent with international literature demonstrating that LGBT young people prefer online support and information over visiting services in person (McDermott et al., 2016).

1.3. Gaming

Gaming refers to the usage of games across a range of platforms including consoles (e.g. Playstation, Xbox, Nintendo Wii), computers and mobile devices including phones (Granic et al., 2014). Games are diverse in their content, purpose and functionality. Granic et al. (2014) argue that games differ fundamentally based on how complex the game is and the way in which the player engages with the game content; specifically whether the game is played cooperatively or competitively, socially or non-socially. While there is no data on gaming usage specifically by TGD young people, we know that gaming is prolific amongst young Australians. Ninety seven percent of households with children have devices for gaming, and, according to parental reporting, 90% of 5 to 14 year-olds game (Brand et al., 2018). Gaming has been found to be a positive way of coping with distress, to provide psychological benefits and to increase psychological wellbeing in cisgender populations (Granic et al., 2014, Griffiths et al., 2013, Wilkinson et al., 2008). Furthermore, TGD young Australians also report using gaming for positive mental health gain, with over 50% of Australian TGD young people stating they use gaming to make themselves feel better (Strauss et al., 2017).

Few studies have explicitly explored the online gaming habits of TGD individuals. We have identified two studies – one study focussed

on the experience of gaming (Griffiths et al., 2016), and another examined gaming addiction (Arcelus et al., 2017). These studies, restricted to adult populations, found gaming was used as a positive psychological tool to increase self-awareness of gender and express one's experienced gender in a safe environment. Furthermore, the ability to inhabit an avatar aligned with their gender identity was noted as having a positive psychological impact on the user. Recommendations included further research to explore the potential of gaming in bringing about psychological benefits for TGD users.

1.4. Game-based digital mental health interventions

As interest in the use of online interventions has grown, recent research has begun exploring the potential of gaming interventions to support mental health. 'Serious games' are games or programs that utilise gaming features for purposes such as learning or health improvements (Arnab et al., 2015). A systematic review and meta-analysis of ten randomised controlled trials on the impact of serious games on a range of mental health symptoms in children and adults showed that serious games may be effective for reducing disorder-related symptoms (Lau et al., 2017). However, more studies are needed regarding the efficacy for specific mental disorders and the longer-term effects of this mode of delivery. Fleming et al. (2014) reviewed the evidence regarding the use of serious games for depression in young people populations aged between 9 and 25 years. The authors found that the six interventions trialled showed promising results with some positive impact upon depression, although they noted that the available data was limited (Fleming et al., 2014).

Drawing on the gaming literature in LGBT+ young people, findings from one study examining sexually diverse young people's perspectives on a game-based program targeting depressive symptoms suggest that this group of young people are discerning consumers of gaming elements (Iacovides et al., 2017). Users raised concerns regarding the binary nature of the avatar in the intervention indicating that the avatar may determine the decision to utilise the intervention or not (Iacovides et al., 2017). Lucassen et al. (2018) explored how and why LGBT+ young people use the internet to support their mental health, as well as the views of LGBT+ young people and professionals on digital therapy, using the example of Rainbow SPARX. This is a serious game comprising seven modules of computerised cognitive behavioural therapy to address depression in sexually diverse young people (Lucassen et al., 2015). Attitudes amongst LGBT+ young people towards the serious game were mixed. Some found the therapy outdated in language, content and design, while others felt positively affected by it. It was suggested that strategies related to stigma and mistreatment, particularly of TGD people, should be included in the game design (Lucassen et al., 2018). The study also found that, despite concerns regarding personal security and internet safety, internet use for support and information was ubiquitous amongst LGBT+ young people (Lucassen et al., 2018).

As noted, there is a paucity of TGD-specific research exploring attitudes towards digital technology to support mental health, and to our knowledge, no studies exploring TGD young people's attitudes in this area have been published. Accordingly, this paper reports on the perspectives of TGD young people towards utilising digital technology to improve their mental health, and specifically on their attitudes towards game-based mental health interventions. Specific research questions included: what do TGD young people find appealing about digital game-based mental health interventions? What are necessary aspects of these interventions to improve uptake amongst TGD young people? These findings represent one component of a multistage study that aims to collaboratively adapt an existing game-based mental health intervention, SPARX, to prevent depression in TGD young people specifically. The co-design process and preliminary evaluation of this adapted intervention will be reported separately.

2. Methods

2.1. Recruitment

Trans and gender diverse young people aged 11–18 years who were located in the Perth metropolitan area were eligible to participate in the study. Parental consent was required for participants under 14 years of age. Recruitment occurred primarily through promotion of the study in local LGBT+ peer-support, counselling, and youth services, as well as via social media. In addition, participants were recruited through an existing longitudinal gender diversity cohort study.

2.2. Participants

$N = 14$ TGD young people aged 11–18 years participated in the study (mean age of 15.6 years). Of the fourteen participants, two were assigned male and twelve were assigned female at birth. Participants reported their gender identity as male or trans male ($n = 9$), female ($n = 1$), agender or non-binary ($n = 3$) and bigender (male and agender; $n = 1$). Eleven participants reported living at home with one or both parents, one reported living with roommates and one reported living with grandparents. One participant did not provide this information. No participants dropped out or refused to participate in this phase of the broader study.

2.3. Procedure

Study participation involved attending two, two-hour face-to-face focus groups (A and B), with 3–5 young people attending each group. The focus groups were held face-to-face to minimise a bias towards individuals who were already engaged in digital environments, and allow for participants who may not traditionally seek out digital environments for support. The first focus group (A) focused on attitudes towards digital and preventive mental health interventions, while the purpose of the second group (B; which was conducted two weeks later) was to obtain feedback on potential adaptations to the SPARX intervention for TGD young people. Four pairs of focus groups were conducted in total with no repeat interviews conducted. Only findings from the four initial focus groups (1A, 2A, 3A, and 4A) will be presented in this paper.

Focus group questions were developed with input from clinicians, researchers and community workers with collective expertise in digital health intervention development and TGD mental health. These questions focused on the supports that participants are already engaged with (all formats including face-to-face and online), what is useful about these supports, and what aspects would be useful and detrimental for inclusion in a digital mental health intervention. Each group was facilitated by two members of the research team (DWT, HM, PS, YP), three of whom identify as cisgender females, and one who identifies as TGD. All of the facilitators had research and/or clinical experience in young people or TGD mental health. Although DWT and PS were known to some of the participants through other pathways, there was otherwise no established relationships between facilitators and participants. The focus groups predominantly took place at a local young person LGBTIQ+ drop-in space in Perth, with one group occurring at the Telethon Kids Institute. All focus groups were audio recorded and field notes were taken. Between groups, the data was examined for saturation and this informed need for emphasis in forthcoming focus group sessions.

Prior to commencing the focus group, all participants and parents (when necessitated by age restrictions) provided written informed consent and the facilitator established group rules around confidentiality, respect and safety. Facilitators of these groups had skills in Mental Health First Aid and/or Applied Suicide Intervention Skills Training or had clinical psychology training to minimise risk in case any individual became distressed during the focus group discussion. At

the beginning of each focus group ground rules were collaboratively set to address privacy and confidentiality concerns. At the conclusion of the focus group, participants completed a brief demographic questionnaire. Participants were reimbursed for their time and travel for each focus group. The study was approved by the University of Western Australia Human Research Ethics Committee (RA/4/20/4242).

2.4. Data analysis

A general inductive approach (GIA) was used for data analysis. Similar to grounded theory and phenomenological approaches, GIA is a method of qualitative content analysis which aims to build understanding from observation and use of pre-existing questions rather than testing a priori hypotheses (Thomas, 2006). Accordingly, the study aimed to explore common themes arising out of responses to focus group questions without the imposition of pre-determined premises. The focus groups were recorded and transcribed verbatim, and the transcripts were checked against the audio recordings prior to analysis. After this check the audio recordings were destroyed. Key themes were identified independently by two of the authors (PS, HM) and coded using NVivo qualitative data analysis software (Version 11; QSR International Pty Ltd., 2015). The themes and subthemes identified by both researchers were discussed in an iterative process for verification. Specifically, similar themes were clustered to reduce overlap and redundancy and a model comprising the most important themes and subthemes was subsequently created.

Quality procedures were used to enhance the trustworthiness of the study findings (Lincoln and Guba, 1985). Specifically, in addition to the use of techniques such as field notes and audio recordings, a member check was conducted at the close of each focus group by reflecting the dominant themes discussed to participants for clarification and further comment. Participants were also able to request full copies of transcripts to provide further feedback and a summary of key themes was provided to all participants prior to the final round of data analysis for their consideration and verification. The consolidated criteria for reporting qualitative research (COREQ) was used to guide reporting of findings. COREQ is a 32-item checklist used for comprehensive and explicit reporting of qualitative studies that utilise in-depth interviews and focus groups (Tong et al., 2007). The completed COREQ checklist has been included as a supplemental file.

3. Results

3.1. Overview of findings

There was general agreement on the feasibility of using a digital mental health intervention to improve the mental health of TGD young people. The following themes were developed: experiences contributing to mental health difficulties; online and digital supports and mental health coping strategies; face-to-face supports and mental health coping strategies; uncertainty about suitability and integrity of online resources; preferred features of digital mental health intervention delivery; preferred timing of delivery of mental health intervention; aspects of games that are advantageous; and aspects of games that are unfavourable. The subthemes emerging in each of these thematic categories, including minor and diverse subthemes, are listed in Tables 1–4, and the prominent subthemes are described in detail below.

3.2. Current supports used

3.2.1. In-person sources of support

Participants were asked about in-person sources of support, and these themes and subthemes are summarised in Table 2. These sources of support help to contextualise what TGD young people are using to manage their mental health. The most common in-person source of support utilised was professional support and resources. Mental health

Table 1
Experiences contributing to mental health difficulties.

Theme	Subthemes
Experiences contributing to mental health difficulties	<ul style="list-style-type: none"> ● Inexperienced navigation of online spaces ● Social media and online information ● Negative encounters online ● Adaptive processing of online spaces ● Glorification of mental health difficulties ● Transphobia and internalized transphobia ● General public education about LGBT+ identities ● Media ● General treatment of TGD people ● Lack of family and community support ● Lack of access to suitable community org support ● Addicted to games ● No representation of gender ● Additional pressures on teenage years because of gender ● Suppression of exploration of gender identity ● Lack of access to suitable services ● Stereotypes and negativity about TGD people ● Isolation from people who understand ● Bullying ● Fan-fiction

Subthemes are listed in order of prevalence.

Table 2
Current supports used for mental health.

Theme	Subthemes
Online and digital supports and mental health coping strategies	<ul style="list-style-type: none"> ● Online diversionary activities ● Apps ● Online mental health resources ● Online support networks ● Online support network through massively multiplayer online game and other game forums ● Gaming ● Online information ● Being “out” online and expressing self ● Importance of internet ● Hearing other people's stories
Face-to-face supports and mental health coping strategies	<ul style="list-style-type: none"> ● Professional support and resources ● Diversionary activities ● Peer support

Subthemes are listed in order of prevalence.

Table 3
Attitudes towards digital mental health interventions and online resources.

Theme	Subthemes
Uncertainty about suitability and integrity of online resources	<ul style="list-style-type: none"> ● Responsive and responsible moderation ● Difficulty finding good-quality, suitably-pitched online resources ● Social media inclusiveness ● Importance of lived experience of authors and creators ● Social media is overly inclusive (too many options)
Preferred features of digital mental health intervention delivery	<ul style="list-style-type: none"> ● Accessibility and flexible delivery modalities ● Sound integrity of resource ● Delivered in a game format ● Transferable mental health content ● Ability to personalise resources ● Supportive and inclusive of TGD identities
Preferred timing of delivery of mental health intervention	<ul style="list-style-type: none"> ● Should educate public ● Prevention over treatment ● Both prevention and treatment ● Treatment over prevention

Subthemes are listed in order of prevalence.

Table 4
Advantageous and unfavourable aspects of games.

Theme	Subthemes
Aspects of games that are advantageous	<ul style="list-style-type: none"> ● Should be discretely about mental health ● Ability to play as and express affirmed gender ● Functionality requirements ● Importance of characters and storyline ● Teaching mental health management skills ● Trigger warnings ● Sense of achievement ● LGBT+ content ● Positive messaging ● Autonomy ● Cathartic violence ● Enduring positive aspect of games ● Games keep you focused ● Broadly applicable games ● Escapism ● Personalised ● Games as artforms ● Role-playing games ● Finding peers and likeminded individuals ● Should be specifically about mental health ● Not inclusive of gender and sexual diversity
Aspects of games that are unfavourable	<ul style="list-style-type: none"> ● Issues with game functionality and design ● Violence ● Inappropriate content ● Self-deprecation and inability to do well ● Triggering to mental health ● Lack of autonomy ● LGBT+ stereotypes and ingenuine representation ● Addictive nature of games ● Domination by intolerant demographic groups ● Toxicity and pressure of team massively multiplayer online games ● Help information not Australian ● Contaminating nature of phobic attitudes

Subthemes are listed in order of prevalence.

professionals were often sought out, as well as school and community-based social supports.

I got referred to headspace [a youth-focussed mental health service] by

my GP and then my counsellor at headspace, umm, suggested like I was going through a really tough time with gender and sexuality, that I come to FC [LGBTIQ+-led youth drop-in space] to try and seek out some support. (Male, 16).

Multiple participants reported personally using in-person mental health support services. Others did not use these services themselves but knew other TGD young people who had found such services to be helpful. Community organisations were dually used for support and as places to socialise with peers. Diversionary activities such as games, hobbies and activities (e.g. music, studying, and drawing) were also used for improving mental health.

I'll never do much else if I'm like not feeling great, I will pretty much always just be focused on music, like I'll either be playing something or just if I'm like well past the point of, you know, not being able to do anything, like I'm feeling horrible and I just can't even lift myself off the floor, then I would probably just listen to music at the very least. (Agender, 16).

Another in-person form of support used were in-person games to bolster wellbeing and improve socialisation, e.g., Dungeons and Dragons and board games. Other participants described peer support as another tool used to improve mental wellbeing.

I, umm, tend to talk to my friends a lot, because most of them are part of the community as well, and so we can kind of relate to one another, and we like, because we tend to just be there whenever. So, whenever we need to talk, we're just there. (Non-binary, 12).

3.2.2. Digital sources of support

Digital sources of support are reported in Table 2. Many participants reported engaging in online diversionary activities when feeling distressed including social media, games and watching online media. Participants reported that these activities took their minds off their concerns, at least momentarily.

It's a distraction from the surroundings and what's happening around you, for me at least, so if something's not going well playing a game provides a distraction and it calms me down because I forget about what's happening around me. (Male, 15).

Apps were the next most common digital activity engaged in to improve mood. Apps that have social channels were commonly referenced, as well as mental health apps, e.g. games, mood-tracking apps, and supportive or interventional mental health apps.

[The app] is actually helpful for just maintaining your depression and anxiety and also like your sleeping routine, and it covers all that sort of stuff and it has like links to online therapy as well, which is really helpful. (Male, 16).

These apps were reportedly valuable due to the mental health management skills that they teach the individual, such as coping mechanisms (e.g. through mindfulness, grounding and breathing exercises) and promotion of self-care. Importantly, once participants found value in such apps, whether designed specifically for mental health or not, young people incorporated them into their routines to self-manage their mental health and promote wellbeing long-term. Consequently, they were regarded by participants as highly accessible and personalizable resources that could be employed flexibly according to the user's need.

Just being able to take a step back and look at how I've been logging my moods, like umm, if I can tell like my anxiety has been like severe over the past month or two months, being able to sit back and just go 'ok, what's happened over this period of time, can I actually change this? If not, how are ways that I can cope with this?' (Male, 17).

Online mental health resources, namely online chat services often

managed by mental health organisations, were also commonly noted as valuable for helping participants with their mental health. Many participants said that they prefer chat and/or email services because it is easier to talk about their mental health issues using indirect forms of contact, it is easier to maintain privacy, and these services have increased availability (especially outside business hours).

Whereas at headspace [an online mental health chat service] you don't ever really talk to this person again, or see them, they don't need to know anything that you don't feel comfortable sharing, and there's no way of them accessing that information that you're not comfortable sharing. (Male, 16).

Online support networks through social media, gaming forums, and other socially interactive websites were also very commonly reported as support mechanisms. Digital friendships were discussed as sometimes easier to navigate than those in real life, and peers were reported as easier to confide in using social media and online avenues.

I've kind of noticed that I can't really talk to people about how I'm feeling face-to-face, like, yeah, it's just so difficult, but I can message my friend or just like, post something on Instagram to like close friends, so I know that two people see it, but it's out there. That's a lot easier than talking to someone. (Male, 15).

Online support networks through MMO (massively multiplayer online) and game forums were also reported as key places for finding LGBT+ peers. Easy access to international communities of peers with lived experience facilitated multiple benefits: uninterrupted sources of support, information, gateways to extended peer networks, and therapeutic opportunities to explore experienced gender identity in the context of evolving friendships.

I got into a Discord server with a bunch of really great trans people and since then I've gotten into lots of other Discord servers, I'm still in that original one, umm, and just talking to other trans people has helped me get info, umm, and be able to like know more stuff. (Non-binary, 17).

These support networks provide a valuable resource for young people who are playing games and exploring online spaces. Aspects of gameplay will be described in detail below.

3.2.3. Experiences contributing to mental health difficulties

The specific themes around experiences contributing to mental health difficulties are reported in Table 1. Participants reflected on various experiences specifically within digital spaces that contribute to mental health difficulties, and these are items to consider when creating digital mental health interventions. A prominent subtheme that emerged was their inexperience with navigating online spaces. They felt this had the potential to affect their mental health through interacting with users who promoted negativity, searching for or inadvertently discovering potentially damaging information, and being unable to adequately protect oneself from harmful information online.

...one of these things with Tumblr is it's quite easy to find very large communities that glorify self-harming behaviours, whether it be eating disorders or, like, you take one step to the left and suddenly you're bombarded and so it's you do, it's, yeah as you were saying if you're in the right place for it, it's, but then if you go the wrong way it's so easy to keep then doing bad habits and following other people that are anyway. (Male, 17).

Social media was also seen as difficult to navigate because of negative interactions with other people online that reportedly impacted on the user's mental health, as well as the sharing of distressing and harmful information that was reported to lower mood.

Instagram I find, and a few the same with games, you have people deliberately go out to say horrible things, people who go out of their way to be, you know, just horrible people. (Male, 15).

Online spaces – both for information and social interaction – were described as complex and while sometimes could be useful, also had the potential to negatively affect a young person's mental health.

I find that just not to go on and trust anything, because like, even though some stuff is news and facts, it's not what, sometimes what you want to hear. Like sometimes it's better to hear what you need to hear, but like, and then sometimes it pops up on, like, stuff that you don't need to hear, or even if it is true. (Female, 11).

Other participants had developed strategies for avoiding these destructive interactions or learning how to process the negativity. Online spaces are environments where TGD young people have learned that they could remove themselves from a situation that was harmful, in contrast to an in-person encounter which may be more difficult to extricate oneself from. Participants stated that depictions of mental health issues, such as self-harm, suicide and eating disorders, can be destructive. Some participants stated that seeing these representations online encourage these behaviours through glorification. Transphobia and internalized transphobia were also experienced in-person and seen online, including personal transphobic attacks as well as witnessing transphobia and reading stories about other transphobic encounters.

I face a lot of transphobia, I can't be publicly non-binary because there's transphobia. (Non-binary, 17).

These factors should all be considered in creating tailored digital mental health interventions for TGD young people to ensure the safety of their delivery to TGD young people.

3.3. Attitudes towards digital mental health interventions and resources

3.3.1. Preferred features of digital mental health intervention delivery

The preferred features of delivery and useful aspects of digital mental health interventions are reported in Table 3. Participants conveyed the importance of accessibility and flexible delivery for all types of digital health interventions. Specifically, participants suggested that any chat or support capabilities should have 24/7 access and that the intervention and interventions should be easy to find.

...something like is big and well known, not like a dodgy site in a corner of the internet where you have to do like gymnastics to find the right download button. (Male, 17).

The intervention should be marketed differently than a mainstream game or intervention in order to attract LGBT+ users. However, it was suggested that the intervention should not be obviously targeted towards TGD individuals (due to the need to maintain privacy when at school or if parental controls exist). Suggestions for how to market the game to LGBT+ users were around advertising, having the intervention come reviewed from a peer, or recommended by a trusted mental health professional.

I think, honestly, if you want to promote it, you'd have to promote it in different ways for trans people or LGBT to start using it and trusting it. (Male, 17).

Participants were open to having a digital mental health intervention delivered as a game, especially if it was a game with good-quality playability and was not solely focused on mental health. This also reflects the opinion of participants that to have such an intervention be successful it should not overtly be a mental health game, but it should have themes of mental health woven into the gameplay. This view was reflective of participants' concerns that openly accessing mental health support could be stigmatising for some and also a less overt method of delivery would be a more effective form of absorbing material that might feel confronting.

...I know that personally I like to seek out games that cover those kind of issues cause that's just me personally... but I think in order to get a wider

audience and to make it more, I guess, digestible for people is to have it just as a normal game so it's not too full on for a lot of other people because that might put them off. (Male, 17).

Other appealing aspects described were transferable mental health content, such as resources to access outside of the game (e.g. signposting to support agencies) and the ability to personalise content (e.g. identifying triggers for experiencing mental health difficulties).

Incorporating resources you can access outside the game, so like if there's some dialogue, having some numbers at the bottom you can call if you're in this sort of situation, or websites... it would be a lot better if you could have that real life resource in the game as well. (Male, 15).

This reflects how a game could have content discretely about mental health (e.g. by incorporating skills to manage mental health), and still provide additional support to those looking for support for their mental health. Resources and content could be tailored to the user, based on information provided at the beginning of the game. As participants were already using resources such as apps to manage mental health, they felt the ability to utilise personalizable game-related resources outside of playing time was integral to a holistic approach to their mental health.

3.3.2. Uncertainty about suitability and integrity of online resources

Themes and subthemes related to the uncertainty of suitability and integrity of online resources are reported in Table 3. Participants felt that it was difficult to find good-quality and suitably-pitched online resources for mental health concerns.

I know there's a lot of online psychology things, but a lot feel like scams, if there was one that was actually more meant for like LGBT [people] that would be useful. (Non-binary, 13).

While some participants reflected that they did not necessarily want a game targeted towards LGBT+ young people, simultaneously others also reflected that games *should* be targeted towards LGBT+ young people and include specific tailored content.

Moderation was also a prominent concern for participants, who did not feel comfortable on some social media, game or websites because of a lack of oversight. Participants alluded to the importance of perceiving site moderation teams as responsible and proactive, given their experiences of comments they felt were transphobic or otherwise inappropriate were not removed from social media, even when reported. Indeed, participants indicated that their choice of social media sites was heavily influenced by whether they viewed the moderation as responsive or not, which was integral to how they assessed the quality of the resource.

There's transphobia everywhere that they won't get rid of even if you report it. (Non-binary, 17).

The integrity of the resource was also deemed important; they suggested that this could be conveyed to a new user through the intervention or resource being recommended by peers, others with lived experience or other like-minded and respected individuals.

...if I know someone or if I can be the person for someone else that goes 'yeah, this game's really good it helped me with this thing' I feel like I would be or they would be more likely to be like, ok, yeah, this helped this person that I know, let's go for it. (Male, 17).

Participants recognised the value in tools being created or monitored by mental health professionals so that the quality of the resource could be assured. TGD young people also reported preferring a game that involved LGBT+ people in at least part of the creation process.

Yeah, like relatability, people like, who umm, like the people who make it, like if they, you know, they're people who are like you, you know. Like I would definitely want to play something if it were made by someone, like from the LGBT community, like that'd be just great. (Male, 18).

The integrity of the resource, and involvement of those with lived experience in creating resources, were linked subthemes underpinned by the concept of trustworthiness. Participants voiced disillusionment and lack of connection with some mainstream mental health resources due to their lack of inclusivity.

Participants also viewed being able to change their name, gender and pronouns as valuable aspects of digital technology's inclusivity and enabled them to find like-minded peers. Furthermore, some participants felt that expressing themselves online was safer than doing so in face-to-face contexts.

Especially with social media and stuff like that it's become easier to be able to find people similar to you in that regard and for it to be, yep, just to be safer than it would be if you were to out yourself in real life then all of a sudden you kind of don't know if you're going to get support. (Male, 17)x.

All of these aspects are important to consider for the development of digital game-based mental health interventions: such a tool should have adequate moderation when it is a multi-user format; users should be able to customise their name, gender and pronouns; and the integrity of the tool is judged by young people on whether mental health professionals and LGBT+ peers were involved in the development.

3.3.3. Preferred timing of delivery of mental health intervention

A main theme that emerged was the attitude towards the timing of delivery of a mental health intervention (Table 3). Participants were asked about whether game-based digital mental health interventions should be targeted as a preventative or treatment tool. The responses were mixed with a clear desire for both options to be considered. A preventative approach was a slightly more common preference due to the thought that it has more benefit to participants and may be more appealing.

I'd say beforehand, because from experience and my friend's experience, once you're down in that space it takes a lot more will power than before to get out of it. (Non-binary, 13).

Other participants reflected that a mental health intervention for TGD young people should specifically be treatment-focussed.

I think that it would be a lot more beneficial if you had it treating that because there's a lot of factors that can influence whether someone has mental health problems so prevention like you said would not really, it would have a really small like you can't always prevent it so it would have a much smaller audience than if it was helping to treat it or manage it really. (Male, 15).

Some participants reflected that it could be helpful to utilise an intervention that aims to prevent worsening symptoms, implying that a targeted prevention approach for those with low level symptoms may be appropriate.

I think like it's important to do stuff, or to do something that'll help people who are already you know, mentally ill, or having trouble, but you, yeah, there should be some way to stop people from getting to that point. (Male, 15).

Some participants voiced that there is feasibility in a digital mental health intervention simultaneously serving as both a preventative measure and a treatment for current depression.

I feel like maybe the, the language used could kind of combine the two, so like, prevent it from going any further than like, where it is, so that could be, you don't have it but you're concerned about where your like, mind could go, or you're really bad and it's kind of like, you know let's, let's stop it where it is now and work on, not being at that stage. (Male, 17).

3.4. Feasibility of games and game-based digital mental health interventions

3.4.1. Aspects of games that are useful

Participants highlighted the theme of useful aspects of games and game-based digital mental health interventions, with subthemes covering both content and functionality (reported in Table 4). Many participants thought that a game-based digital mental health intervention should have the capacity to enhance, without being explicitly targeted on, mental health. An example of an existing game that participants frequently reported does this well is *Night in the Woods*.

Night in the Woods, that definitely covers the mental health issues and it's known for that in a way but it's not known as a game about mental health issues. It's got artistic value, it's got really nice characters, it's got really nice gameplay so making sure that those things are covered as well will have people want to play it, even if it does specifically cover that kind of thing. (Non-binary, 17).

While most participants reflected that a game-based mental health intervention should avoid being seen only in those terms, some did mention that they seek out games specifically to help with mental health.

For me personally, often when I've found games or sites or apps that have been particularly useful for me it has been when they've been mental health related, it had been because I've been looking for them and I don't know, I don't think it's necessarily a bad thing to like, like I guess, glaring "this is about mental health"... people who want mental health help will seek it out if they know that's in it I guess. (Male, 17).

Being able to play as the individual's affirmed gender (through role, expression, and pronouns) was also highlighted as an important aspect of identifying and connecting with the game. This process reportedly allowed individuals to experience their life from a different perspective and in some instances, facilitated the process of gender identity consolidation in a safe environment.

If you have a game where you play as like different characters, umm or like a character you can identify with, like, when I, dysphorically [was dysphoric], I used to play as male characters in games and then when I switched to like playing as female characters it was all a lot more validating. (Agender, 16).

Game functionality was discussed as an important aspect of engagement and enjoyment, including accessibility and cost of the game, degree of socialisation available via game chat functions, and overall user-friendliness of the game. Further to functionality, the characters and storyline were both seen as vital to the appeal of the game, especially when the player can connect with the character and/or storyline.

That's like my go-to game when I feel stressed or anxious because instantly I can relate to the character and I just calm down. (Male, 15).

The quality of the storyline was also seen to be important, especially when the game is trying to teach the player something about mental health.

Yeah and I think it's done in that way that people without a history of mental health issues can still relate to and enjoy because like I say it's a well written story and it is covered in such as way because it's not too explicit, you know it doesn't say "this character was diagnosed with blank or this characters has blank", you know it's more the things she goes through. (Male, 17).

This storyline helps to engage individuals with the intervention and keep them engaged after initial access. Many participants also felt that a game that taught them mental health management skills would be advantageous. Such considerations were echoed throughout the focus groups, indicating participants' desire for skill acquisition and autonomy in managing mental health challenges rather than being seen as passive consumers of supportive interventions.

And that's why I think anyone can take something away from being shown management skills rather than being shown how to stop mental illness or how to treat illness. (Male, 17).

Equipping individuals with the skills to manage their own mental health would likely have long term benefits and enable the individual to handle future stressors that they are faced with.

TGD young people appreciated the importance of overall trigger warnings implemented by games, apps and online spaces. Some participants reflected that they wished they could personalise trigger warnings (e.g. by describing their personal triggers), so that they would be aware of any potential mental health concerns.

I think that's really important having the trigger warnings because I know that I've played games where they haven't had that and in movies and stuff and when it approached that you go into a state of panic and I wasn't expecting this'. That's why I think it's really important they put that in. (Male, 15).

Games that gave the participant a sense of achievement and personal efficacy were also viewed positively as activities that would bolster mental health, and also a mechanism for staying engaged in gameplay.

I think, like, in a way having a goal to work towards is something that helps as well because if you're striving for something, then having that goal or reward like the levelling up system it gives you more of an incentive to move towards that. (Male, 15).

Such content in a game may help to continue engagement with the game itself, providing individuals with a goal to work towards. LGBT+ game content was also important to some participants, including having LGBT+ characters, storylines and themes embedded in the game. The LGBT+ content desired was not necessarily about having a character or storyline centred on that character, but simply including LGBT+ characters in the story.

The LGBT stories that I've come across that have really helped me are less about say like the struggles trans people have, they're more about them just existing as people, having LGBT characters just exist as people, go through normal person problems and live a normal life with friends... I've had enough of the sob story of how being trans is so hard, like I know! (Male, 17).

Representation of LGBT+ identities emerged as a subtheme across these areas discussed, whether it is inclusion of LGBT+ characters within the storyline, creation, and/or the distribution and marketing of the intervention. Other subthemes that emerged were positive messaging within games, having autonomy, and using violence in games as a cathartic outlet.

3.4.2. Unhelpful aspects of games and game-based digital mental health interventions

The theme of unfavourable aspects of games and game-based digital mental health interventions and subthemes are reported in Table 4. The major subthemes included games that were not LGBT+ inclusive, with functionality issues, or contain violence or inappropriate content were viewed as the most harmful or unhelpful. Games that were not inclusive of diverse genders and sexualities were considered to be unattractive to users because users were often torn between wanting to play a popular game and feeling excluded from the game during gameplay.

Games like role playing games, when you first start it starts like if you're a boy or if you're a girl, and if you're like non-binary or gender diverse you have to try and either not play it or pick one and it's quite annoying to try and do that because you don't identify as either of them, so I guess that can also cause a bit of, like, definitely if it is like a popular game and all like your friends are playing it, it's like should you make the sacrifice to like do that or just not do it so I guess that can also cause, I don't know,

you could also feel left out if it's a popular game, so that could cause isolation. (Non-binary, 12).

Game functionality plays a large role in how much TGD young people enjoy playing the game. Specific aspects of functionality mentioned were game design, pace and financial cost associated with accessing and progressing in the game. Other significant game issues were violence and inappropriate content, especially violence directed towards LGBT+ characters and content triggering mental health issues.

I don't know if you guys have seen this at all but sometimes I've found, especially with like, queer women in games, sometimes there seems to be like, if it's a more violent type of game, or like there does seem to be like, a little bit more violence or something I don't know, queer characters in a violent game they can sometimes be like the receiver of significantly more violence it seems than like the more like straight or cis characters sometimes so that's a bit like aargh! (Male, 17).

While a game-based intervention may contain valuable mental health messaging, users will not engage with the material if the format of the game itself is difficult to navigate and use. Other negative game features that emerged were a lack of autonomy, LGBT+ stereotypes and a lack of genuine LGBT+ representation.

Stereotypes is a big thing in games and media, and I think it would be beneficial if they didn't focus so much on like general stereotypes, like if you have a gay character, often in games or movies they have a really high voice and stereotypes like that. (Male, 15).

Ensuring that LGBT+ voices are heard in the creation of a digital game-based intervention could help to overcome many of these barriers, through shaping game content and trialling the game with young people to evaluate the playability of the game.

4. Discussion

The participants in the current study voiced interest in game-based digital mental health interventions, and their potential utility in TGD populations. The attitudes reflected within this paper regarding games, apps and other online platforms have implications for the content and function of such an intervention. Specifically, the intervention should involve TGD or LGBT+ consultation in its development and should be marketed to TGD young people through trusted sources, namely mental health professionals or peers. The appropriateness of material was an important theme that emerged such as excluding content that is not inclusive of LGBT+ identities and violence targeted specifically at the LGBT+ characters. Participants identified that trans-affirmative, peer-informed and gender inclusive related content is important to gameplay. Participants voiced that a positive feature of many games is the ability to play as, and express, their affirmed gender.

Being able to express one's true self or see diverse gender identities reflected, was viewed as important and empowering, and individuals felt excluded from games (or other digital avenues) when they did not see themselves represented. Considering this, LGBT+ characters in game storylines are fundamental to the accessibility of a digital game-based mental health intervention. Moreover, being able to explore and express gender through online spaces was seen as safer than doing so in some face-to-face contexts. Participants could use this autonomy in online spaces to be their true self without commentary or threat from external society. The therapeutic benefits of safe gender identity exploration and expression, over and above any mental health gains conferred by dedicated interventions, cannot be overstated for this vulnerable population. In the general population, most young people report an online presence and this presence is important to identity formation and expression because it is a space, alongside the real world, that allows for freer exploration during this important developmental period (Marwick et al., 2010). Given that expressing their experienced gender in real life may pose a variety of challenges and risks for TGD

young people, virtual spaces, particularly anonymous ones, provide a crucial opportunity for users to develop and rehearse their gender identities in a relatively safe space (Craig and McInroy, 2014).

The majority of participants were firm that the mental health aspects of the intervention should be discretely included, and the game should look and seem like a mainstream game as opposed to a mental health tool masquerading as a game. Previous research has raised some concern that if young people are aware they are playing serious video games to benefit their mental health they may experience decreased intrinsic motivation and a negative affective experience. This was examined by Poppelaars et al. (2018) by having undergraduate students play a commercial cooperative video game that had been framed as either an entertainment-focused game or a mental health game. They found that autonomy was negatively affected by the mental health messaging when compared to entertainment messaging, although intrinsic motivation was not impacted by messaging.

Game-based digital mental health interventions need to be in a game format that overall is acceptable and enjoyable for the user to play. This includes having appropriate usability features such as good-quality graphics, the option to pause the game and take breaks, and to be appropriately paced. Participants also reflected on their own self-deprecation as a barrier to some games, as they identified that feeling like a failure had a detrimental effect on their mental health. While participants did not specifically reflect on how a game-based intervention could handle this difficulty, it is important for game developers to consider this point when creating a game-based digital mental health intervention. This is related to participant viewpoints that having achievements helps to boost self-esteem and confidence through conveying a sense of accomplishment.

The ability for game-based digital mental health interventions to teach skills on mental health management was a key theme. Participants in this study were already using apps and online tools to help them track potential triggers for poor mental health, as well as mindfulness and grounding activities, although some noted mainstream resources were lacking for the TGD population. Consequently, participants proved to be discerning consumers who sought out appropriate resources where possible and autonomously incorporated them into their routines, as needed. Indeed, given a third of young people with poor mental health in the general Australian population already seek out online support services (Johnson et al., 2016), it is imperative that TGD young people also be given options that are considerate of diversity. Furthermore, previous research has shown that LGBT young people may not actively seek help for their mental health due to coping with difficulties on their own and isolating themselves (McDermott et al., 2018). Digital mental health interventions may be able to reach these young people who are not actively seeking help, and by providing mental health management tools could help to alleviate mild distress and through providing resources could assist in linking young people to additional support suited to that individual.

Studies that have elicited young people's views on digital mental health interventions in cisgender populations indicate shared viewpoints and concerns with the participants of this study regarding the use of such resources. Kenny et al. (2016) found that the use of apps to address mental health difficulties was favourably viewed, although participants identified several key concerns influencing likelihood of use. In keeping with our findings, young people rated safety (e.g. confidentiality, discrete nature of application and ability to block unwanted content or report it to a responsive moderator) as key alongside the importance of finding the resource engaging and personalizable (e.g. being able to create one's own profile). Similarly, there were shared findings regarding the importance of functionality (e.g. chat functions linked to professional support and signposting to appropriate support agencies) and perceived integrity of the resource more likely to occur if the resource was recommended by trusted sources such as peers (Kenny et al., 2016). This corresponds with other themes that emerged around an overall uneasiness and untrustworthiness of resources in

general, unless they are recommended by a trusted source.

Supports that are available in formats that are not face-to-face are seen favourably as they allow the individual to maintain a degree of separation from the person or service providing support. Factors that are useful about in-person forms of support should also be used to inform digital mental health interventions, specifically the timeliness of responses and immediate availability of the service/support. Digital interventions may be able to better cater to the need to have an immediate response than an alternative form of support needing monitoring (e.g. chatlines, phone support).

A study exploring the views of cisgender young people regarding use of Internet-based platforms for mental health support found that use of online support in the form of an interactive website offering information, a chat function with professionals and self-testing was favourably received. Notably, participants expressed the importance of anonymity and confidentiality when getting support, responsiveness of the service (e.g. a preference for instant chat function over an email service) and the need to find the resource trustworthy before engaging (Havas et al., 2011). These findings are similar to the results reported here, and combined they convey that there are many aspects of any digital mental health intervention that are likely universal to all young people, including anonymity, reliability, autonomy and personalisation.

To date the research concerning digital mental health and health interventions for young people has predominantly focussed on testing the clinical effectiveness of specific interventions or examining the effectiveness of groups of treatments relating to certain conditions or disorders (Beale et al., 2007; Fleming et al., 2014). Conversely, very few studies have explored the attitudes of young people towards such interventions. This is surprising given the recognised importance of seeking out and obtaining young consumers' views to inform and shape digital health interventions if they are to be effective and usable (Orlowski et al., 2016; Kenny et al., 2016). Moreover, the inclusion of young people with the mental health condition targeted by such a game-based intervention assists with ensuring that the mental health condition is depicted accurately (Fordham and Ball, 2019). The findings herein describe a plethora of attitudes towards a digital mental health intervention that should be considered before the creation, during the development, and while marketing and disseminating such an intervention.

4.1. Implications

In order to appeal to TGD young people, a game-based digital mental health intervention needs to be a high-quality game recommended by peers and/or health professionals that subtly targets mental health. Previous research has demonstrated that health professionals are willing to recommend game-based digital mental health interventions to LGBT+ young people who have low mood (Lucassen et al., 2018), which offers feasibility for the dissemination of this kind of intervention. Participants of this study were supportive of the idea of a game that helps to both prevent and treat depression in TGD young people. Additional features of game-based mental health interventions highlighted by participants included the involvement of LGBT+ people in the creation process of the game. These focus groups brought to light the importance of mobile apps and the overlap of their utility with that of video and computer games for alleviating distress. This is especially important in the context of isolated populations who may not be able to, or may choose not to, access mainstream mental health services. Future research should investigate whether app-based games are an appropriate pathway for mental health interventions in TGD young people.

4.2. Limitations

The participants in this study may not have been a representative sample of TGD young people for several reasons, the first of which is the

small sample size of participants. In addition, recruitment materials clearly stated that the study was about gaming, so participants who were inherently more interested in games were more likely to have participated. Further, the current sample reported relatively high levels of parental support and almost all participants lived at home with their parents. High levels of parental support may be attributed, in part, to the recruitment methods as those under age 14 needed parental consent. The majority of participants were assigned female at birth and the sample may not be representative of all TGD young people. Some focus groups had different co-facilitators which potentially could have impacted participant responses. In addition, some sessions did not have time to discuss all questions included on the interview guide due to time restrictions. These potential limitations can be addressed through further in-depth investigations.

4.3. Conclusions

The attitudes of TGD young people expressed in the current study show promise with regards to the potential utility of delivering mental health interventions through digital games. The findings from this study indicate that the format and style of the game is important for successful uptake. Considering the prevalence of mental health difficulties in this population this avenue warrants empirical investigation as a means of reaching and assisting TGD young people.

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Declaration of competing interest

None declared.

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Appendix A. Supplementary data

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