



Mental Jam: A Pilot Study of Video Game Co-creation for Individuals with Lived Experiences of Depression and Anxiety

Hsiao-Wei Chen¹(✉), Jonathan Duckworth¹, and Renata Kokanovic²

¹ School of Design, RMIT University, Melbourne, Australia
{michelle.chen, jonathan.duckworth}@rmit.edu.au

² School of Global, Urban and Social Studies, RMIT University, Melbourne, Australia
renata.kokanovic@rmit.edu.au

Abstract. Mental Jam is a research project that explores how methods of video game co-creation can facilitate the participation of individuals with lived experiences of depression and anxiety to build empathy and mental health awareness among young people. Previous studies have explored the use of different artistic mediums to represent different lived experiences and to raise awareness in the community. Video games are an interactive and immersive medium which can inspire players to learn about other people's lived experiences. However, facilitating the participation of individuals with lived experience in the creation of video games is not well understood. Through a participatory action research methodology, we developed a game jam workshop designed to facilitate the co-creation of video games with participants using diverse video game design approaches, such as narrative-driven game design. We report the results from a pilot study, which comprised of narrative interviews and a game jam workshop through which a game called *Counter Attack Therapy* was produced. In conclusion, we discuss how the outcomes contribute to the field of art-based knowledge translation, as well as expand upon how game design approaches may benefit individuals with lived experiences of depression and anxiety.

Keywords: Game jam · Video game · Participatory action research · Knowledge translation · Lived experience · Depression · Anxiety

1 Introduction

Mental health is a vital part of our health and wellbeing. Mental health is defined by the World Health Organisation (WHO) as a state of wellbeing where someone can recognize their abilities, handle normal life stress, work productively, and contribute to their community [1]. In 2015, the United Nations (UN) included the promotion of mental health and wellbeing for the first time in their Sustainable Development Goals [2]. According to the WHO it is important to engage and empower people with lived experience of mental illness, by closely collaborating with them in the promotion of

mental health advocacy [3]. One of the goals of the WHO's Mental Health Action Plan is to decrease stigma and discrimination by educating the public through mental health awareness campaigns. There is also a visible shift of focus from mental illness treatment to the promotion of mental health, wellbeing, and resilience [4–6].

One of the ways to promote mental health is through the knowledge translation of the lived experiences through different artistic mediums. Knowledge translation is a term used to describe how knowledge is disseminated, exchanged, and applied from a range of participants and perspectives [7]. For example, people have portrayed their first episode of psychosis through dance [8] and used drawings and digital media to express experiences of illness [9, 10]. The Big Anxiety Festival have also explored the use of arts and science to convey the people's experience of anxiety [11]. MENTAL Jam is a research project that explores the knowledge translation of young peoples' lived experiences of depression and anxiety through video games co-creation. Video games are interactive and immersive, which makes it a powerful medium for representing lived experiences and inspire players to gain a more insightful understanding [12]. Video game development is also multidisciplinary, which provide multiple ways for people with lived experience to tell their stories, such as through the narrative, art, music, and game mechanics.

In recent years, there has been an emergence of deeply personal video games about game developers' experiences of mental illness [13]. For example, *Depression Quest* and *Actual Sunlight*, are both narrative-driven games based on the game developers' lived experience of depression [14, 15]. For Zoe Quinn, developing *Depression Quest* helped her deal with her lived experience, and for her, having players experience what it feels like to live with depression is a powerful use of games as a medium [15, 16]. While for Matt Thorson, the developer of *Celeste*, a platformer game about depression and anxiety, rather than portraying representation of mental illness defined by mental health professionals, Thorson explored these themes based on his perspective [17]. Researcher Sandra Danilovic explored how lived experiences of game developers are portrayed in video games. She introduced the term autopathographical games, which are games that explore game developers' autobiographical experiences of illness as a form of self-care, understanding and therapy [13].

The existing games about the lived experiences of depression and anxiety, including Danilovic's research, are often developed in isolation by solo or small teams of game developers. For Danilovic's research, her participants were developing games on their own, which suggests they had all the skills required, including design, programming, and art [13].

In developing Mental Jam, we take a different approach that encourages young people with lived experience of depression and anxiety, to work together with game developers to co-create video games. People with lived experience are involved in the research from the very beginning and throughout the entire process to guide the research process and to ensure lived experiences are represented in every step of research.

Mental Jam is based upon game jam design workshop designs that have been used as a method by researchers to capture the whole game development process from ideation to development to release [18]. A game jam is an event where game developers can work alone or in teams, with a balance of skills and interests, to make a game based on a given

theme in a short duration, which ranges from 48 h to slow jams that last a month [18]. Some events are conducted in a physical location, such as Global Game Jam, while some are conducted online, such as Ludum Dare [19]. Game jams also promote community building through a shared experience of being in the same location and a mutual interest in game development [20]. Locke et al. compared game jams to performative artworks, where video games are co-created through group participation, and the development process is as important as the games produced [21, 22]. Game jam participants are also empowered by the shared ownership of developing a game from start to finish [22].

Before the game jam workshops, we also conducted one-on-one semi-structured narrative interviews with young people with lived experiences of depression and anxiety. The participants were to give an uninterrupted account of their experience. We conducted these interviews, because participants may not be comfortable sharing their lived experiences with the group during the game jam workshops. The interview transcripts were deidentified and participants were given a pseudonym to protect their anonymity. The interviews were also thematically analysed to identify recurring themes [23], and a report of the findings was presented at the start of the game jam workshops and informed the game design.

This paper is a report from the pilot study of the research, which comprised of narrative interviews and a game jam workshop, which produced a game called *Counter Attack Therapy*.

2 Methods

To develop Mental Jam, we deployed a Participant Action Research (PAR) methodology to facilitate a collaborative process whereby the different stakeholders work together through an iterative process of reflection and action to solve a problem, and the process itself is as important as the outcome [24, 25]. PAR is a user-centred approach, where participants are the real experts of their experience [16]. They are involved in every step of the research process, from design to data gathering, analysis, and conclusions [26] which can give them a sense of empowerment [27].

This research is reviewed by an independent group of people called the Human Research Ethics Committee (HREC). This research project has been approved by the RMIT University HREC.

For this research, the participants are young people, aged 18 to 25, who were diagnosed or who self-identified with lived experience of depression and/or anxiety. Participants must also be currently, by their own account, sufficiently well to participate in research. Participants ideally should have an interest in gaming and/or in learning game development. The research also collaborates with game developers, such as programmers, artists, game designers, writers, and musicians.

As the research involves participants with mental illness, we asked participants to assess that they are sufficiently well to participate in the research. According to Roberts, people with mental illness can give informed consent [28]. Participants were the ones to determine their capacity to consent and participate in the research. The participants also must have sufficient cognitive capacity to be able to give informed consent. Each participant was also be given a Participant Information and Consent Form, in which they will give their written consent to participate.

Since the research is recruiting participants who are sufficiently well, it is unlikely that they will find this aspect of the research will be stressful or upsetting. However, reflecting on lived experiences of depression and anxiety may result in some discomfort. Before the start of each activity, we explained to all participants that their participation is voluntary and that they can discontinue or take a break at any time. During the game jam, we checked up on participants from time to time, to check on their progress, as well as check for any signs of distress. Game jams are normally low stakes environments and flexible with each participant's time and commitment. Participants at the game jam workshops are advised to maintain the confidentiality of their fellow participants. Participants were advised to only share things that they are comfortable with, and other participants are advised that any information is shared in confidence. Help-seeking information was also provided to, which included contact numbers of mental health support services and telephone helplines.

For the pilot study, we recruited four participants through personal networks and snowballing. Eligible participants were self-identified or report receiving a diagnosis of the lived experience of depression and anxiety, who are currently, by their own account, sufficiently well to participate in research. Due to the current pandemic situation, all the interviews and game jam workshops were conducted online via Microsoft Teams, which allowed participants who are based in different countries, such as Australia, Vietnam, and the Philippines, to participate.

Prior to the commencement of the game jam workshop, we interviewed each participant between 20 min to an hour which were video recorded via Microsoft Teams. The interviews were semi-structured, and participants were invited to give an uninterrupted account of their experience with depression and/or anxiety. Participants are encouraged to talk about anything that they feel are important and as much as they are comfortable with. The interviewer asked a few follow-up questions to clarify aspects of participants' experience, as well as to ask about participants' recovery journey, and a key message that they would like to include in a video game to encourage others to seek support.

The interviews were transcribed initially using the automated transcription software, Otter [29], and manually checked and deidentified. To maintain the anonymity of research participants, they are given a pseudonym. The interviews were analysed using thematic analysis [23] to identify recurring themes. An initial coding framework was developed based on the study conducted by HealthTalk Australia on people's lived experience of depression and recovery [30]. HealthTalk Australia interviewed 39 people in Australia and they identified themes, such as "Understanding Experiences- stories of depression", "Negotiating the Health System", "Everyday Life- Support and Challenges" and "Message to Others" [30]. The interview transcripts were analysed to refine the coding framework, identify themes, and produce a report [23].

From the four participants who participated in the interviews, two of the interview participants, who were based in Vietnam were recruited for the pilot game jam workshops. The other two participants from the interviews will be recruited for another game jam workshop iteration. The participants of the game jam workshops are Helen, a recent graduate living in Hanoi; and Melisa, a student studying in Ho Chi Minh.

Due to participants availability, the game jam workshops were held online via Microsoft Teams over multiple sessions that lasted between 30 min to two hours

over three weekends. The sessions were video-recorded via Microsoft Teams with the participants' consent for later analysis.

The first game jam workshop session began with a presentation about the aims of the research project and a showcase of example video games that were about depression and/or anxiety. The presentation also included the thematic analysis from the interviews and introduced some tools that would be used in the game jam workshop, such as Trello, an online post-it board [31], and Microsoft Teams.

During the second session, participants were led in a discussion about the thematic analysis report, followed by a brainstorming session about the game that they will develop. The brainstorming session was held on a Trello Board, where participants could add cards (like post-it notes) to different lists, which were labelled "Game Mechanics", "Narrative", "Art Style" and "Other Ideas" (see Fig. 1). Trello also allowed participants to attach images, links, and comments to cards, as references to the art style. The ideation session for the game jam workshop followed IDEO's design thinking and their field guide that included step-by-step instructions for ideation activities, such as brainstorming and storyboarding [32]. The brainstorming session occurred in 3 min bursts, where participants were invited to add as many ideas as possible to the Trello Board. Participants were encouraged to draw from their personal lived experiences, the thematic analysis report, and build on each other's ideas. After each burst, a brief discussion was held about the ideas added. Some bursts focused on a particular aspect, such as the narrative and building the main character of the game. The session lasted 2 h, with a clearer idea of the mechanics, narrative, and art style for the game.

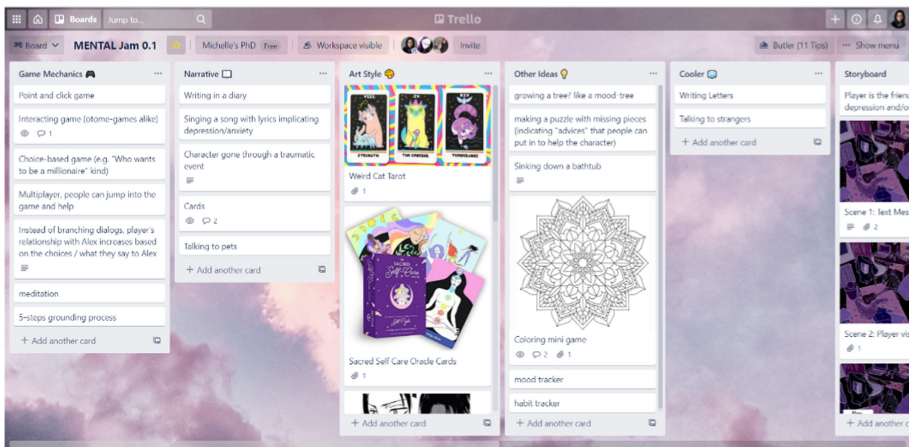


Fig. 1. Game jam workshop brainstorming session using Trello.

The Trello board was set up to track the tasks to be accomplished, with "To Do", "Doing" and "Done" lists. Trello can also add checklists and assign participants to cards. The researcher assigned tasks for the group: the participants would oversee the game design and narrative, while the researcher would oversee the art and code for the game. The researcher also scheduled another session for participants to reconvene and report on

their progress. In the meantime, the researcher experimented with art styles and created the background art for the game.

The third session was scheduled two days after the first session. Unfortunately, one of the participants was unable to attend due to personal reasons. During this session, the other participant, Helen, took the lead on the narrative script of the game. The script was written in a shared Microsoft Word file on Microsoft Teams. The researcher scheduled the next session a week later.

During the week, Helen worked on the script, while the researcher developed the character art, user interface (UI) for the game. She also experimented with tools that will assist in the coding of the game. She also started developing the game using Unity, which is a free and popular game engine for game development [33], and YarnSpinner, a plugin for writing game dialogue [34]. YarnSpinner allows game developers to write the script in plain language (see Fig. 2), add options and branching dialogue to their game.

At the fourth and fifth session, which were held on the same day, both participants were able to attend and both Helen and the researcher presented their work in progress and there was a discussion on different aspects of the script, the art, and the game design. The game was further developed over the course of a week which gave the researcher time to finish development. The researcher was able to present a working version of the game at the sixth and final session for the participants to playtest. The participants were also able to give feedback on the game.

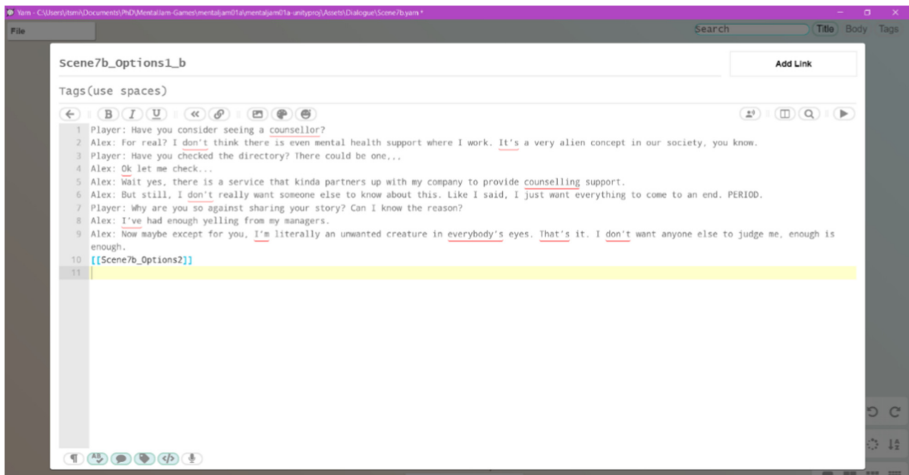


Fig. 2. The script of the game in plain language, using YarnSpinner.

3 Outcomes of the Mental Jam Online Workshop

Counter Attack Therapy is a game that was developed over three weeks with participants about their lived experiences of depression and anxiety. It is an interactive narrative game about Alex, a humanoid cat in their mid-20's. As a friend, the player will listen to Alex's

story, guide them through the battle and gather useful resources to help take care of their mental health (see Fig. 3).

In the next four section we discuss the themes identified from the interviews. The narrative and design of the game were based on four main themes that were identified from the interviews: “Views about Causes of Depression and/or Anxiety”, “Experiencing Depression and/or Anxiety”, “Support and Challenges” and “Recovery”. The game is released on itch.io, a website where independent game developers distribute their games (<http://mentaljam.itch.io/cat>) [35].

3.1 Theme 1: Views About Causes of Depression and/or Anxiety

Interview participants identified different reasons for the cause of their depression and/or anxiety, including isolation and traumatic events, such as bullying, sexual assault, verbal and emotionally abusive relationship, and an incident at a workplace.

Some participants felt that their depression and/or anxiety was caused by isolation, especially during the lockdown. While for another participant said her depression first started when she started living in an apartment by herself to move closer to her workplace.

For another participant, Helen, who also participated in the game jam workshops, her depression started after an incident at her workplace and a motorbike accident:

I made a mistake [at work], and then the, like my boss got fired instead of me, and that makes me really, like really shock and then really, really depressed. Because, like, why do they do that? Like, I couldn't really understand... I [also] had an accident. So I crashed my motorbike into another motorbike and had a twisted leg after the accident, so basically, I fell into like extreme anxiety and depression for like, half a month afterwards. Like I couldn't understand, like, Why do everything had to go wrong at the same time?... (Helen)

Based on Helen's lived experience, for the game, the main character, Alex, also encountered some trouble at work that caused their depression and anxiety. During the game, Alex also encounters a motorbike accident and ends up with a cast on their arm.

3.2 Theme 2: Experiencing Depression and/or Anxiety

When experiencing depression and/or anxiety, some participants avoided people, slept a lot and crying, and some of them considered self-harm.

To avoid people, participants would stay in their room, attend lectures online, stop responding to emails and text messages. During the game jam workshop, Helen added:

at times I don't, I just don't want to talk to people. Like I have, like, I know I should tell somebody or some like, I had to reply to anyone reply to this email that message and but I just don't want to. (Helen)

Some participants said that they spent a lot of time sleeping, one of them said they hoped that sleeping would numb the pain:

I think the general feeling was just like hoping to sleep to numb the pain. But then, waking up and realizing the pain is still there, and then you just until you just don't want to do anything anymore... I mean, what was I doing when I was at the lowest point of my depression, anxiety? Was majority spending all that time in bed? Sometimes awake, sometimes not... It's like, you know, if you're healthy, is like staying on bed for forever, you'd be so restless you like I wanna get out I wanna do something how is it that I wasted so much time staring at the ceiling and then just then suddenly like realizing what the day is gone and feeling sleepy so I sleep again like. (Jacob)

While another participant, Melisa, felt immobilized:

I feel like I'm, I'm kind of immobilized, I was kind of immobilized back in time I can sleep, like, for 14 days straight without going out my room, I cannot do anything at all, even like I cannot like doing some self care back in time. So one day, my mom just took me out my bedroom, and she decided to cut all my hair because it's just tangled into like, a big lock, and then I had to cut all of them out. So that's it. And that is like how, like my normal symptoms back in time. (Melisa)

Melisa also participated in the game jam workshop. During the brainstorming session, while designing the character Alex, she wrote: "Alex's hair is cluttered due to lack of self-care", she also included reference images to "depressed hair".



Fig. 3. Screenshot from *Counter Attack Therapy*, showing Alex sleeping, contemplating suicide.

Melisa also mentioned that some things that would remind her of a traumatic event would trigger suicidal thoughts:

Also, I I was really impulsive back in time, especially like, at the time but I feel like I I feel like when my suicidal thoughts came in, I was really impulsive. And if

there was any triggers like blood or knife or any kind of news that makes that made me realize to realize to the day that I was assaulted... When I start dealing with suicidal thoughts, even I did actually suicide before. And then I got into hospital a lot. (Melisa)

During the game jam workshop, while designing Alex's room, Melisa wrote down "medicine packages are everywhere". In one of the scenes in the game, Alex went to sleep, and there is a thought bubble with pill bottles in them. According to Helen: "But like, Alex really wishes everything would act peacefully in their sleep (see Fig. 3). So that would be indicative of like suicide by overdosing pills, you know? Yeah." While reviewing the script for the scene, Melisa added: "Oh, you remember like the time I was overdose in hospital? That time I sleep yeah... I was overdose so so I like when I read that. I remember that day."

While designing Alex's room, both participants also added that there will be beer bottle and cigarettes, even though none of the participants mentioned vices during their interviews. It was only during the game jam workshop, when the researcher was showing the art of Alex's room (see Fig. 3) that Melisa pointed out the beer bottle and cigarettes and added, "I drink a lot of beer. I used to smoke but I just stopped smoking five or six years ago".

3.3 Theme 3: Support and Challenges

Participants sought support from family, friends, mental health professional, and even strangers, however, some of them faced challenges such as stigma and discrimination.

Two participants felt that they were not able to talk to their parents about their depression and/or anxiety, because their parents would not understand. While another participant was quite open to tell her parents because her mother noticed her symptoms.

Most participants found that talking to their friends was useful and found their friends quite supportive. They also found that after they shared their experiences, their friends also shared their own. While another participant noted that some friends were not supportive and are quite judgmental.

All participants were seeing a mental health professional, such as a counsellor or therapist through their university or workplace. Some participants were accessing mental health services during Covid. Participants also talked about getting prescribed medication for their depression and/or anxiety. One participant noted the lack of access to mental health support in Vietnam, while another noted the cost of services in the Philippines. Melisa also talked about the culture shock she got when she moved back to Vietnam from Australia.

Some participants faced stigma and discrimination. During the game jam workshop, Melisa shared her experience with facing discrimination from her ex-boyfriend and his friends while she was living in Australia. Helen shared similar views in Vietnam:

in Vietnam, it's more viewed like the princess or Prince sickness. Because the perception is like, because they they are rich like the the like, they are rich. They don't like what like just says just something like maybe just one bit of thing went wrong, and they're already having a mental breakdown. And it's one of the stigma... (Helen)

In the game, the player is Alex's friend who offers advice. The game presents choices of dialogue that the player can tell Alex (see Fig. 4). The player also suggests to Alex to see a mental health professional, but Alex was initially resistant as portrayed in one of dialogues in the game:

Alex: For real? I don't think there is even mental health support where I work. It's a very alien concept in our society, you know. (Counter Attack Therapy)



Fig. 4. Screenshot from Counter Attack Therapy, showing dialogue choices.

3.4 Theme 4: Recovery

Participants were asked about the pivot point that prompted them to seek support, they also shared their self-care and coping strategies. Participants cited that the pivot point for them to getting support is when they realised that they needed help because they cannot handle it on their own and they want to get out of the cycle of depression. Participants mentioned different coping strategies that were suggested by the mental health professional, such as breathing, meditation, gratitude journal and painting.

For the game, the participants included a breathing exercise mini-game (see Fig. 5). Participants also mentioned some coping strategies that they found useful, such as practising kendo, singing, reading books, and watching anime movie.

One participant shared that singing is one of her coping mechanisms:

Yeah, actually, singing has been helping me a lot. I've been doing cover songs that I have upload in FB. Yeah. Yeah. So that was my way to release because I think I get distracted whenever I cover songs. Because you know, I try to internalize the character, the song. Yeah, I also have to learn how to edit in GarageBand. How to

mix how to set up my my mixer the microphones that I have to use etc. So you know, like keeping my mind off from overthinking and I get to do more of my creative side, also “ano ba” [I don’t know] I don’t know... (Rachel)

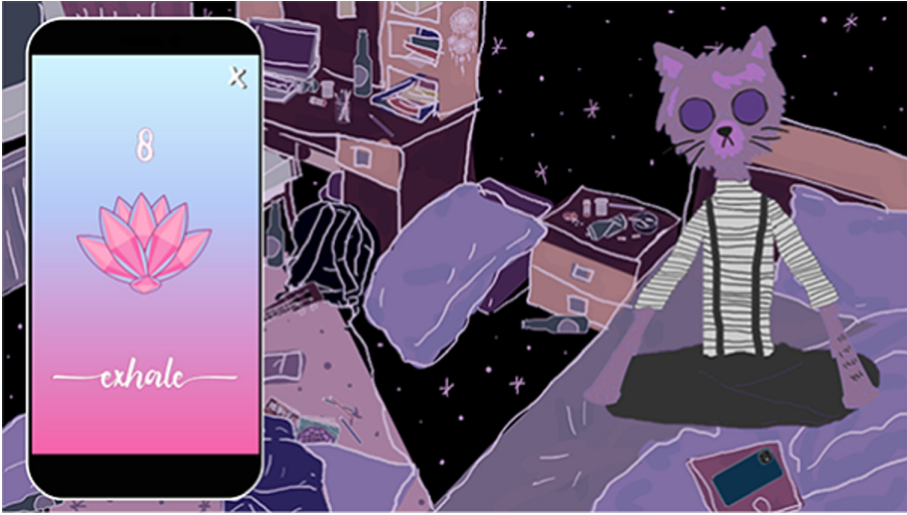


Fig. 5. Screenshot from *Counter Attack Therapy*, showing Alex practising a breathing exercise mini-game.

At the game jam workshop, the participants also discussed how some singers incorporated themes of depression and anxiety into their songs:

So I got the idea from one of my favourite singers [Jonghyun] that actually commit suicide from depression. Who was sending, like signalling help from one of his songs [Lonely], but we never realized until he passed away. (Helen)

Alex’s clothes are also based on the outfit Jonghyun was wearing in his music video for the song *Lonely* [36]. In one the of scenes in the game, Alex plays the ukulele and sings a song with the lyrics:

*I am in the middle of nothing
 Wonder how did I end up like this
 How did I make such a stupid mistake
 To cause everything to fall
 Get out of bed is even a challenge
 Out to the door and there’s nothing but a dark cloud
 Of thoughts that I just want to scream
 This tangle, when will you let me out? (Counter Attack Therapy)*

Melisa also shared that watching anime movies as a coping mechanism, she cited Attack on Titan, whose main character Eren, represented a lot of what she was feeling back then:

Because it's his [Eren] action actually, like, represents my mindset. When I look at the world. I still remember one of the quotes from Mikasa is this word is cruel, but also beautiful. And I think his action also represent that quote, but also represent my mindset. Like when I'm dealing with depression as well, the motive the motive is because he is because he was paying back the world just because of his mom's death. And I think that, that trauma can lead to that kind of action. And I think it makes sense is just because, like, is it similar to when they, I don't feel that this society doesn't understand me at all, they don't understand what I'm feeling. And I want to destroy the whole world just because I don't feel like. I don't fit to this world. And I want to redo everything. And yeah, and that's, and Eren's action is actually, like, they will actually, like represent my mindset when I'm dealing with depression. So that's why it's like, even the Attack on Titan is a very violent anime. But I feel like, it's still good for me, because I feel because it represents what actually happened. (Melisa)

There are elements from Attack on Titan in Alex's room, such as the logo on the jacket and a manga on the floor. There are also references to Attack on Titan in the script of the game. The name of the game, Counter Attack Therapy is also based on the song Counterattack Mankind from Attack on Titan's soundtrack.

Helen also mentioned that one of her friends (Melisa) read tarot cards for her at the time and it helped her focus. The participants included an oracle tarot card mini-game, which will give the players and Alex advice and encouragement:

I talked to so one of my friends, like, she can read tarot cards, and I asked her how, like, how should I do? And she, she read the tarot. And then she told me to just focus on on work, because, like, by focusing on the work that could kind of help me forget about, like, stuff like that. So I did. I basically focus crazily on work and assignments and try to get that out of my head. (Helen)

In the game, Alex's appearance, background colour, and background music changes based on their current mood. As Alex starts feeling better, the background becomes lighter, and Alex's appearance becomes a lighter shade of purple, and their facial expression is happier (see Fig. 5).

4 Discussion

This paper summarizes the methods of the pilot study for Mental Jam, where four participants were interviewed and two participants participated in a series of game jam workshops to develop the game, *Counter Attack Therapy*.

We used PAR methodology to engage participants in all the phases of the research, from design to execution and dissemination [37, 38]. For this research, the participants

were involved in every step of the process, from the ideation of the game design to the release and marketing of the game.

While some prior research excluded some participants, who did not feel equipped to express their experiences through academic writing [39–41], such as the participants of a research about mental health care felt that their experiential knowledge was undervalued because the reporting phase was conducted by academic researchers [40]. This research ensured that participants voices are heard throughout the process, and they had the final say of what goes into the video games and how their lived experiences are represented.

We found that participants were quite open with sharing their lived experiences of depression and anxiety during the interviews and game jam workshops. Working closely with participants in the game jam workshops over three weekends, also allowed rapport building between the participants and the researcher.

Prior research in co-design and participatory design with participants with psychosis [42] and dementia [43, 44] have found the use of a relatable fictional character allows their participants to share their lived experiences in an indirect way. Similarly, during the ideation session, as the participants are creating a composite character in the third person, a humanoid cat named Alex, they were more open to sharing personal experiences and incorporating some of the physical aspects of themselves into the character. For example, during the interview, Melisa described how her hair got so matted that her mother had to cut it off, this was translated into Alex's messy fur in the game. Halfway through the game, Alex gets into an accident, and their fur turns a darker shade of purple and messier (compare Figs. 4 and 5). Even little details, such as the logo on their jacket is based on one of Melisa's favourite anime movies.

Some information that the participants did not share during their interviews were also revealed during the ideation session, such as the beer bottles and cigarettes that the participants added to Alex's room. It was only during the game jam workshop that Melisa revealed that during her depressive episode, she used to drink and smoke a lot as a coping strategy.

The game jam workshop was originally planned to take place over 48 h on one weekend, however, due to participants availability, as well as the extended scope of the game, it took place over three weekends instead. The researcher and participants also worked on the game asynchronously during the week.

PAR methodology also encourages researchers and participants to work closely together to co-create new knowledge through iterative action and reflection [24]. After the conclusion of the game jam, we also conducted one-on-one interviews with the participants workshops to ask for their feedback about the facilitation of the game jams, and their game development process. The researcher also asked about the things that can be improved about the process.

One of the things Melisa learned from the game jam workshops is collaborating online with distant teams, which she found particularly useful during the current pandemic. Prior research found that working together as a group through a shared social experience of a game jam also fostered a sense of belonging [48]. The participants also found Trello useful in keeping track of each other's progress during the week, as well as give them a sense of a shared space even though they were based in different places.

I think like working on Trello is fine, because we have like a common platform together. Although we, you me and Helen we live in, like some places that we are very distant from each other. Right? Yeah, that by doing everything on Trello together, I think that it's really good for me to keep up with the process of how everything has gone so far... thanks to Trello... I know like how, how the ideas just like are arranged and how the process going so far... And I still like getting updated every day. And then yeah, it's still like it's kind of same to working side by side. But [sometimes] it's about internet connections. (Melisa)

Even though the participants did not have a background in game development, they found the game jam workshops rewarding because they learned new skills and developed a game for the first time. The game jam experience also challenged their notions on what game development involves:

I never thought I would be able to make a game, because I have that kind of perception that only programmers could make the game, you know. (Helen)

Prior research on game jams has also found that making is entertaining even for newcomers [45]. Game development is multidisciplinary, so participants can contribute to the game in different ways. In this pilot study, the participants contributed to the game design and narrative writing, while the researcher oversaw the art and programming. This finding concurs with another example, in *The Street Arcade*, game developers collaborated with a group of African American teen artists to develop video games. The teens contributed to the game design, narrative, and art for the games, while game developers were the ones who programmed them [46].

During the game jam workshops, Helen has a cast on her arm from a recent accident and participating in the game jam workshops and developing a game gave her a sense of accomplishment:

I feel like I achieved something. During my time that I thought I would never be able to do anything. Like, I was thinking like, what, what the hell can I do with a hand in the cast, and then locked down and then stuff like that, I just can't really contain the thought of being useless. But this game really gave me the chance to do something that can contribute something to the mental health issue. Like specifically from my own experience. (Helen)

In the post-game jam interview, Helen suggested that maybe during the game jam workshops, all participants can share their screens at the same time, so that they can be more engaged and provide real-time feedback. Currently, a limitation of using Microsoft Teams for the game jam workshop video calls, only one person can share their screen at one time. For future game jam workshops, we will survey alternative video conferencing platforms.

The game was released on itch.io, and so far, has over a thousand views and positive feedback from players. The participants have marketed the game on their university's social media pages, as well as getting a feature on a local lifestyle website, *Urbanist Vietnam*, which describes Helen's experience developing the game [47].

Through the game jam workshops and developing the game, the participants found a way to reflect on their lived experiences of depression and anxiety and share them with people in a different way:

By developing a game, and I think back about my story, and I think about how did I overcome every How did I overcome everything and share it with the people. It's not really like explicitly as I share about my story, but like through the game, I share the story of mine to like the audience. And I think that when I witness that the the audience like they welcome the game and they just think they were really excited and how they support it. And I thought it was I feel really relieved... because people accept my story people accept our story... and people welcome our project in a very positive manner, which is something that I've really, really treasured... (Melisa)

It was absolutely like, like life changing and mind changing for me. Because it was like, because my story. It was a very negative, like a very bad memory that I somehow it's sometimes I just kind of want to forget it. And then imagine my mind is like a drawer, and I'm just gonna put it into a drawer and then lock it away and never talk about it again. But this game jam, it has made me realize that, like, not everything bad that happened in the past has to be bad. Forever, like with the right strategies, and like, with the help of team members, teammates, and with the correct like, tactics and strategies, like I can completely, turn it into something positive and then inspire other people. (Helen)

5 Conclusion

The key findings from the pilot study are: (1) the benefits of working in groups; (2) participants were able to learn new skills; (3) a sense of belonging for the participants; (4) the research provided a venue for the participants to reflect, as well as share their lived experiences of depression and/or anxiety; (5) the use of a relatable fictional character allowed the participants to share their lived experiences in an indirect way; and (6) for future game jams, a longer and more flexible timeframe can be considered.

Working in groups and collaborating with the researcher, who is a game developer, allowed participants to develop a game even though they did not have a background in game development. Participants were also able to learn new skills, such as narrative script writing for games, and collaborating online using Trello.

The participants also reported a sense of belonging. Even though the group was based in different cities, the use of Trello to keep track of tasks and seeing each other's progress gave them a sense of shared space as if they were "working side by side".

The narrative interviews, as well as the game jam workshops, gave the participants an opportunity to share their lived experience stories. Using the literal narrative-driven approach, participants' lived experiences of depression and anxiety were translated in the narrative writing. The game included the participants' views about the causes of their depression and anxiety. This game was based on Helen's personal experiences, which was an incident she faced at work, followed by a motorbike accident. The use of the relatable fictional character also allowed the participants to create the composite

character, the game's main character, Alex. Alex portrayed different symptoms that the different participants had while experiencing depression and anxiety, such as sleeping a lot, their lack of self-care, which resulted in their messy hair and room. The game also explored some of the support and challenges the participants faced, such as accessing mental health services. The game also included some mini-games, such as breathing exercises, a puzzle game and oracle tarot cards, which participants have used as coping mechanisms.

Based on the findings of the pilot study, for future game jam workshop iterations, the researcher may also consider a longer time frame, like slow jams, which last from a week to a month. This may allow participants to have more time to develop their game design and work on the game development tasks. The feedback from the pilot study will also inform the next iteration of the game jam workshop process. As the research project applies PAR, the game jam workshop process will go through iterations of planning, game jam execution, and evaluation.

The favorable and promising response from the game jam participants demonstrated that the game jam workshop was a feasible way for developing video games about the lived experiences of depression and anxiety.

References

1. World Health Organization: Promoting Mental Health: Concepts, Emerging Evidence, Practice (2004)
2. United Nations: Transforming Our World: The 2030 Agenda for Sustainable Development (2015)
3. World Health Organization: Mental Health Action Plan 2013–2020 (2013)
4. Buse, K., Hawke, S.: Health in the sustainable development goals: ready for a paradigm shift? *Glob. Health* **11**, 13 (2015)
5. Dybdahl, R., Lien, L.: Mental health is an integral part of the sustainable development goals. *Prev. Med. Community Health* **1**(1), 1–3 (2017)
6. Izutsu, T., Tsutsumi, A., Minas, H., et al.: Mental health and wellbeing in the sustainable development goals. *Lancet Psychiatry* **2**, 1052–1054 (2015)
7. World Health Organization: Knowledge Management and Health: News and Events (2005)
8. Boydell, K.M.: Making sense of collective events: the co-creation of a research-based dance. *Forum Qual. Sozialforschung (Forum Qual. Soc. Res.)* **12**(1). Art. No. 5 (2011)
9. Guillemin, M.: Understanding illness: using drawings as a research method. *Qual. Health Res.* **14**(2), 272–289 (2004)
10. Patel, V., Saxena, S., Lundt, C., et al.: The lancet commission on global mental health and sustainable development. *Lancet* **392**, 1553–98 (2018)
11. Bennett, J.: Anxiety: art and mental health. *Artlink* **37**, 3 (2017)
12. Solberg, D.: The problem with empathy games. <https://Killscreen.Com/Articles/The-Problem-With-Empathy-Games>. Accessed 21 June 2021
13. Danilovic, S.: Game design therapeutics: autopathographical game authorship as self-care, self-understanding, and therapy. PhD thesis. University of Toronto, Toronto, Canada (2018)
14. Smith, E.: 'Actual Sunlight' might be the most painfully real video game you'll ever play. https://www.Vice.Com/En_Ca/Article/4wbn9d/Actual-Sunlight-Might-Be-The-Most-Painfully-Real-Video-Game-Youll-Ever-Play-000. Accessed 21 June 2021
15. Parkin, S.: Zoe Quinn's Depression Quest. <https://www.Newyorker.Com/Tech/Annals-Of-Technology/Zoe-Quinns-Depression-Quest>. Accessed 21 June 2021

16. Lewis, H.: A quest for understanding. *Lancet Psychiatry* **1**(5), 341 (2014)
17. Grayson, N.: Celeste taught fans and its own creator to take better care of themselves. Kotaku. <https://www.Kotaku.Com.Au/2018/04/Celeste-Taught-Fans-And-Its-Own-Creator-To-Take-Better-Care-Of-Themselves/>. Accessed 21 June 2021
18. Foltz, A., et al.: Game developers' approaches to communicating climate change. *Front. Commun.* **4**, 28 (2019)
19. Kultima, A.: Defining game jam. In: *Proceedings of the 10th International Conference on the Foundations of Digital Games (2015)*
20. Turner, J., Thomas, L.: CoCurating game jams for community and communitas a 48 h game making challenge retrospective. In: *Proceedings of the International Conference on Game Jams, Hackathons and Game Creation Events (2020)*
21. Locke, R., Parker, L., Galloway, D., Sloan, R.: The game jam movement: disruption, performance and artwork. In: *Proceedings of the 10th International Conference on the Foundations of Digital Games (2015)*
22. Bayrak, A.T.: Jamming as a design approach. Power of jamming for creative iteration. In: *Design for Next 12th EAD Conference*. Sapienza University of Rome (2017)
23. Braun, V., Clarke, V.: Using thematic analysis in psychology. *Qual. Res. Psychol.* **3**(2), 77–101 (2006)
24. Bergold, J., Thomas, S.: Participatory research methods: a methodological approach in motion. *Forum Qual. Soc. Res.* **13**(1) (2012)
25. Manzo, L.C., Brightbill, N.: Toward a participatory ethics. In: Kondon, S., Pain, R., Kesby, M. (eds.), *Participatory Action Research Approaches and Methods: Connecting People, Participation and Place*, pp. 33–40. Routledge, London (2008)
26. Whyte, W.: Introduction. In: Whyte, W.F. (ed.), *Participatory Action Research*, pp. 7–18. Sage, Newbury Park, CA (1991)
27. Boote, J., Telford, R., Cooper, C.: Consumer involvement in health research: a review and research agenda. *Health Policy* **61**(2), 213–236 (2002)
28. Roberts, L.: Evidence-based ethics and informed consent in mental illness research. *Arch. Gen. Psychiatry* **57**(6), 540–542 (2000)
29. Otter. <https://Otter.Ai/>. Accessed 29 June 2021
30. Depression and Recovery in Australia. <https://Healthtalk.Org/Experiences-Depression-And-Recovery-Australia/Overview>. Accessed 21 June 2021
31. Trello Helps Teams Move Work Forward. <http://Trello.com/Home>. Accessed 21 June 2021
32. Brown, T.: Design thinking. *Harv. Bus. Rev.* **86**(6), 84–92, 141 (2008)
33. The Leading Platform for Creating Interactive, Real-Time Content. <https://Unity.com/>. Accessed 21 June 2021
34. Yarn Spinner the Friendly Tool for Writing Game Dialogue. <https://Yarnspinner.dev/>. Accessed 21 June 2021
35. About Itch.Io. <https://Itch.Io/Docs/General/About>. Accessed 21 June 2021
36. Smtown.: JONGHYUN 중현 'Lonely (Feat. 태연)' MV. <https://www.Youtube.com/Watch?V=Nptpese9g8c>. Accessed 29 June 2021
37. Vollman, A.R., Anderson, E.T., Mcfarlane, J.: *Canadian Community as Partner*. Lippincott Williams & Wilkins, Philadelphia (2004)
38. Smith, L., Bratini, L., Chambers, D., Jensen, R.V., Romero, L.: Between idealism and reality: meeting the challenges of participatory action research. *Action Res.* **8**(4), 407–425 (2010)
39. Fricker, M.: Epistemic justice as a condition of political freedom? *Synthese* **190**(7), 1317–1332 (2013)
40. Groot, B., Haveman, A., Abma, T.: Relational, ethically sound co-production in mental health care research: epistemic injustice and the need for an ethics of care. *Crit. Public Health* (2020)
41. Rose, D., Kalathil, J.: Power, privilege and knowledge: the untenable promise of co-production in mental "health." *Front. Sociol.* **4**, 57 (2019)

42. Nakarada-Kordic, I., Hayes, N., Reay, S.D., Corbet, C., Chan, A.: Co-designing for mental health: creative methods to engage young people experiencing psychosis. *Des. Health* **1**(2), 229–244 (2017)
43. Hendriks, N., Truyen, F., Duval, E.: Designing with dementia: guidelines for participatory design together with persons with dementia. In: Kotzé, P., Marsden, G., Lindgaard, G., Wesson, J., Winckler, M. (eds.) *INTERACT 2013*. LNCS, vol. 8117, pp. 649–666. Springer, Heidelberg (2013). https://doi.org/10.1007/978-3-642-40483-2_46
44. Tseklevs, E., Bingley, A.F., Luján Escalante, M.A., Gradinar, A.: Engaging people with dementia in designing playful and creative practices: co-design or co-creation? *Dementia* **19**(3), 915–931 (2020)
45. Balli, F.: Game jams to co-create respiratory health games prototypes as participatory research methodology. *Forum: Qual. Soc. Res.* **19**(3), Art. 35 (2018)
46. Annas, P., Groden, S.Q.: The street. *Radic. Teach.* **113**, 6–7 (2019)
47. Urbanist Vietnam: Nhóm Sinh Viên Ra Mắt Tựa Game Nhẹ Nhàng Đều Cao Sức Khỏe Tinh Thần. <https://Urbanistvietnam.com/Hanoi-Technology/16864-Nh%C3%B3m-Sinh-Vi%C3%A0n-Ra-M%E1%BA%Aft-T%E1%BB%B1a-Game-Nh%E1%BA%B9-Nh%C3%A0ng-%C4%91%E1%BB%81-Cao-S%E1%BB%A9c-Kh%E1%BB%8Fe-Tinh-Th%E1%BA%A7n>. Accessed 21 June 2021
48. Turner, J., Thomas, L., Owen, C.: Living the indie life: mapping creative teams in a 48 h game jam and playing with data. *IE2013*. Melbourne, Australia (2013)