

**Psychotherapy in the Digital Environment:
A Single-Family Case Study of Digital Art Therapy through Virtual Reality to Improve
Adolescent Mental Health**



Undergraduate Thesis

Submitted by

KHADEGA MOHAMMED AHMED ALHADI

21321310

**BACHELOR OF COMMUNICATIONS
FACULTY OF SOCIAL AND CULTURAL SCIENCES
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2025**

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Approved:

Date: 22 August 2025

A handwritten signature in blue ink, appearing to read 'Zaki Habibi', with a stylized flourish at the end.

Dr. Zaki Habibi, S.IP., M.Comms.

STATEMENT OF ACADEMIC ETHICS

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Signing below, I:

Name : KHADEGA MOHAMMED AHMED ALHADI

Student Number :21321310

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Yogyakarta, August 22th 2025

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21321310

VALIDITY SHEET

UNDERGRADUATE THESIS

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Case Study of Digital Art Therapy through Virtual Reality
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Arranged by:

KHADEGA MOHAMMED AHMED ALHADI

21321310

It has defended and has been validated by the Thesis Committee of
Communication Science Department in Faculty of Socio-Cultural and
Science of Islamic University of Indonesia

Day: Friday

Date: 22 Agustus 2025

Thesis Committee:

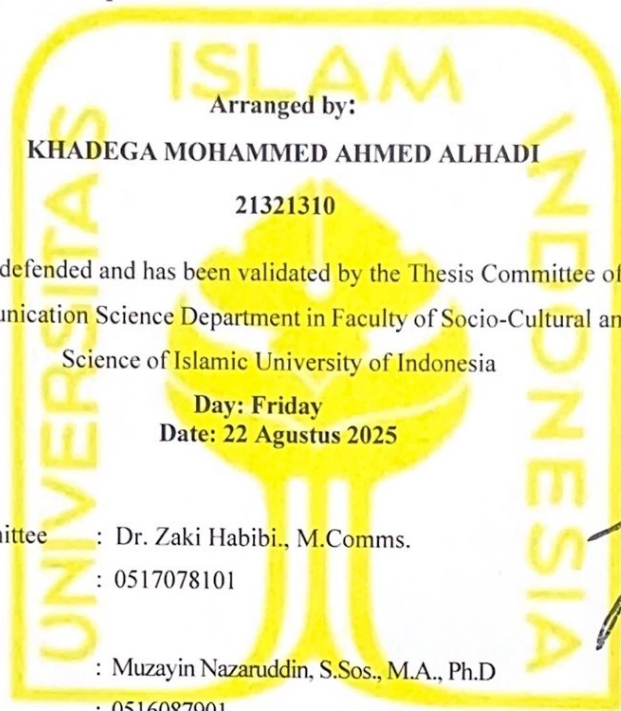
1. Head of Committee : Dr. Zaki Habibi., M.Comms.
NIDN : 0517078101

2. Examiner : Muzayin Nazaruddin, S.Sos., M.A., Ph.D
NIDN : 0516087901

Head of Undergraduate program,
Faculty of Social and Cultural Science
Universitas Islam Indonesia

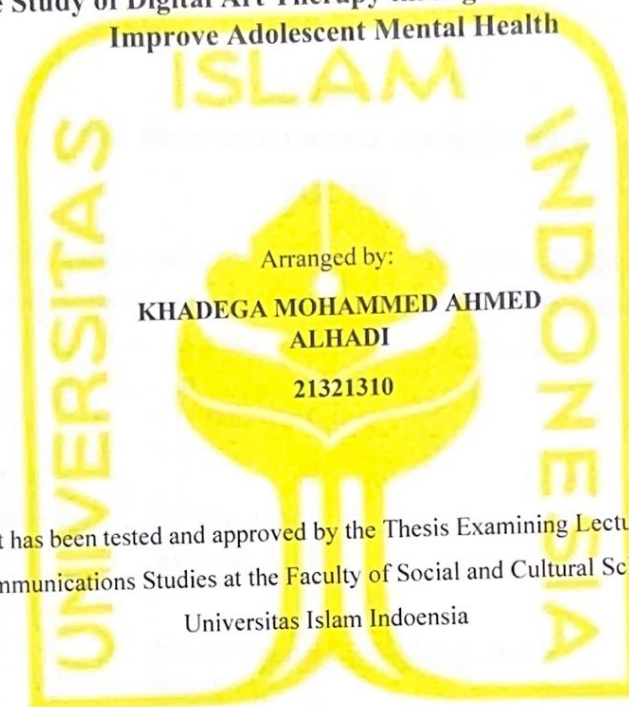
Dr. Zaki Habibi., M.Comms

NIDN: 0517078101



**LETTER OF AGREEMENT
UNDERGRADUATE THESIS**

**Psychotherapy in the Digital Environment: A Single-Family
Case Study of Digital Art Therapy through Virtual Reality to
Improve Adolescent Mental Health**



Arranged by:

**KHADEGA MOHAMMED AHMED
ALHADI**

21321310

It has been tested and approved by the Thesis Examining Lecturer
Communications Studies at the Faculty of Social and Cultural Sciences
Universitas Islam Indoensia

Date: 19 August 2025

Thesis Supervisor,

Dr. Zaki Habibi., M.Comms.
NIDN:0511047202

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Abstract

This study explores the therapeutic potential of virtual reality art therapy in supporting the mental health of adolescents. VR presents an interactive environment that enhances emotional relief and raises creativity. This research implemented an action qualitative design employing a single-family case study of three adolescent participants who struggle with anxiety, nervousness, stubbornness, and social isolation. Data was collected through VR art therapy sessions and semi-structured interviews. Findings revealed six sub-themes: “Mechanism of emotional expression and coping,” self-representation”, “social opening”, “future aspiration”, “adaptation of virtual reality”, and Creative Freedom”. Results demonstrate the efficiency of virtual reality art therapy in offering adolescents a safe, engaging, and culturally adaptable space for healing and growth.

Keywords: *Psychotherapy, virtual reality, art therapy, Adolescent Mental Health, qualitative research.*

Abstrak

Penelitian ini mengeksplorasi potensi terapeutik dari terapi seni berbasis realitas virtual (VR) dalam mendukung kesehatan mental remaja. VR menghadirkan lingkungan interaktif yang meningkatkan pelepasan emosi serta mendorong kreativitas. Penelitian ini menggunakan desain kualitatif tindakan dengan studi kasus keluarga tunggal yang melibatkan tiga partisipan remaja yang mengalami kecemasan, kegelisahan, sifat keras kepala, dan isolasi sosial. Data dikumpulkan melalui sesi terapi seni berbasis VR dan wawancara semi-terstruktur. Temuan penelitian mengungkap enam sub-tema: mekanisme ekspresi emosi dan coping, representasi diri, pembukaan sosial, aspirasi masa depan, adaptasi realitas virtual, dan kebebasan berkreasi. Hasil penelitian menunjukkan efektivitas terapi seni berbasis realitas virtual dalam menyediakan ruang yang aman, menarik, serta dapat disesuaikan secara budaya bagi remaja untuk proses penyembuhan dan pertumbuhan.

Kata kunci: Psikoterapi, realitas virtual, terapi seni, kesehatan mental remaja, penelitian kualitatif.

Chapter 1

1. Background

The digital environment in psychotherapy is a recently developed form of virtual spaces that allows individuals to interact with rehabilitation activities using recent technology. It can include various features, depending on the therapy's aim, such as video, messaging, art, and mental exercises. After the 2020 epidemic, people have increasingly exhibited tendencies toward gadget addiction compared to the pre-pandemic period. Therefore, scientists and scholars have increasingly relied on specifically designed programs in trials to promote mental health and to support the treatment of certain psychological issues. Due to that, such a technique brings forth the idea of being able to rehabilitate without requiring physical presence. According to Lancia, Festa, Sisinna, & Ciarrocchi (2023), virtual worlds, such as the metaverse and holography, have proven to be essential tools in the field of psychology.

Virtual Reality is a computer simulation with a three-dimensional environment that allows users to experience and engage with elements as if they were physically present. It can be experienced through a headset and motion controllers connected to a computer or gaming platform. VR is widely used in gaming, education, therapy, and training because it creates a sense of presence and emotional engagement that traditional screens cannot offer. Virtual reality is one of the innovations that has traction for its immersion and interactive potential (Bodenbender, C. 2022). It offers an unreal environment of spaces that can be considered suitable for expressing, evoking emotions, and entertainment. The younger generation, compared to previous generations, has the ability to adapt to emerging technologies, positively impacting their behavioral changes and cognitive development (Hutson, 2022).

Nonetheless, the safe space virtual reality provides offers a groundbreaking approach to therapy. The environment is customizable, which can support healing and promote healthy growth. The individuals can confront fears, express emotions, practice in worlds with unique feelings, and remain risk-free. Virtual reality can be the bridge to deepening the understanding of practical engagement in therapy for adolescents. Assisting them to confront anxiety, trauma, and social challenges without real-world exposure (Shi Z, & Wang Y, 2024).

While VR has been explored in various therapeutic contexts, its application in art therapy remains a recent approach that needs more development to ensure its effectiveness. benefits like telepresence, controlled environments, and interactive digital tools that enhance

emotional expression and engagement are highlighted in VR therapy (Shi Z, & Wang Y, 2024). Which can be a key factor for adolescents who struggle with mental and social issues to navigate this technology with ease and help them grow their mental health and raise their digital literacy. As the field evolves, integrating VR into art therapy demands thoughtful design, inclusive practices, and ongoing refinement to truly support mental wellness in diverse populations (Marks, Marks & Brown, 2017). This research proposes shedding light on the virtual reality spaces and the ability to take advantage of its pace into advancement to improve adolescent mental health as a response to the emerging technology.

2. Problem Formulation / Research Question

VR can be considered a strong tool to be used in developing human skills. This is particularly relevant among young individuals, who not only exhibit signs of gadget addiction but also demonstrate curiosity toward reliable development and enhance their cognitive skills. This research aims to answer the following questions:

- To what extent can virtual reality-based features function as an independent tool for therapeutic purposes?
- How can virtual reality promote the creative skills of young individuals in order to boost mental health?

3. Research Aim/Purpose and Research Objectives

Psychotherapy relies on technology to expand its efficiency. The system may undergo significant advancement with minimal human intervention. As such, this research aims to investigate the potential of a system integrated with multiple features to autonomously manage therapeutic processes.

Virtual reality, on the other hand, provides individuals with imaginary space in which they can express themselves. Within therapeutic purposes, this is considered a patient room that allows individuals to feel more comfortable. Therefore, this study investigates the potential of virtual spaces to promote the creative abilities of adolescents in improving mental well-being without requiring the physical presence of professional practitioners.

4. Research Benefits

This research can contribute to the communication psychology field by advancing understanding of emerging media and strategies for improving digital literacy among young people from a psychological perspective. It also offers value to any organization that is eager to study the impact of emerging VR technologies on cognitive development.

Additionally, it is relevant to developers, programmers, and engineers seeking to refine the technology to align with current technological trends to fit the needs of nowadays technology adaptation based on scientific papers' results.

5. Literature Review

5.1 Previous Research:

Art therapy is not a recent method to promote overall well-being and mental health. Similarly, it's been merged into current technology to boost the practice. Richesin, Baldwin, and Wicks (2021) conducted a study comparing the effects of 2-dimensional and 3-dimensional art-making among participants to measure stress, anxiety, and mood. The study found that both groups of 2-dimensional and 3-dimensional art-making show signs of reductions in stress, anxiety, and mood disturbances. But the group of 3-dimensional art-making merged with virtual reality environment demonstrated the most significant improvements, particularly in heart rate reduction. That indicates the benefit of virtual reality for rehabilitation purposes.

The Metaverse—which is one of the most popular virtual reality environments—has been used as a therapy environment for an 11-year-old boy with ADHD (Attention-deficit/hyperactivity disorder). The study by Jinkyung Kim and Yeo Ju Chung (2024) conducted 12 sessions of art therapy in a metaverse environment and found that the boy exhibited several key outcomes: enjoyment through art activities, communication enhancement in the digital world, widening the experience immersion of both virtual and reality and emotional relief. Overall, the metaverse offers the potential to provide an efficient art therapy environment that is considered a medium for creativity and promotes social connection in the digital age among children.

Virtual reality is an enormous digital space containing various programs with different aims. In the context of digital art therapy, scholars investigate artistic applications and

measure their effects on participants. Zubala, & Hackett, (2020) examined the therapeutic application of Tilt Brush in clinical settings. Their findings demonstrated that TiltBrush has proven useful for therapeutic purposes. Participants reported understanding how to use the tool therapeutically, while practitioners observed increased playfulness, discovery, and engagement. Therefore, virtual reality itself provides the opportunity to create without interacting with certain platforms. Powered by artificial intelligence, VR platforms offer users a range of intelligent features that support creative exploration and personal expression.

“VRAT,” on the other hand, is a term referring to virtual reality art therapy, and its approach defines the space as a medium for artistic expression for therapeutic purposes. Irit, Hacmun, Dafna, Regev, Roy, and Salomon (2021) investigated VRAT from an art therapist's perspective to demonstrate its essential role in promoting mental well-being aspects. Therapists agreed that VR provides engaging and enjoyable experiences, plays a significant role in art therapy, and can be considered a target for all society groups. However, they emphasized the importance of maintaining a clear therapeutic relationship between user and practitioner to demonstrate its effectiveness.

In the current digital era, young individuals demonstrate greater attachment to technology compared to other social groups who grow up lacking gadgets. Psychological development without inducing adverse mental effects is crucial. VR as a therapeutic medium for adolescents has been proposed by Shamri Zeevi (2021). In this research, two individuals aged 13 and 16 have participated in a trial to treat anxiety and social issues through a virtual reality environment. This experiment shows that using technology can significantly enhance a better understanding of adolescents' needs in the absence of non-verbal expressions.

Most of the previous research illustrates the significance of practitioner presence during the observation period. Practitioner monitoring is critical when it comes to measuring the vital signs of the participants. Vitality measurement is being recorded and needs a specific expert analysis. This research investigates the potential for participants to benefit from the virtual reality programs without being monitored by an expert.

5.2 Theoretical Framework:

1) Art Therapy in Virtual Reality:

Art therapy is a widely recognized therapeutic approach used to address various psychological conditions and improve mental health. When integrated with modern technologies, art therapy brings innovative engagement, allowing users to create unique explorations of their thoughts, emotions, and expressions. Virtual environments not only introduce new modes of interaction but also facilitate innovative interaction and discovers new methods of therapeutic approaches. For this reason, Hadjipanayi, Banakou, & Michael-Grigoriou (2023) conducted a review of 33 studies to examine the potential applications of this technology in virtual reality art therapy. The results show that VR can be used to improve therapy purposes in various ways:

- VR provides an immersive and engaging virtual environment that creates a safe space for free expression through art.
- VR eases communication between users and practitioners which enables them to address certain goals and monitor progress.
- Empirical studies have demonstrated VR's effectiveness in reducing anxiety, boosting self-esteem, and processing trauma.
- VR offers various tools and mediums that contribute to therapeutic engagement in ways that are not feasible with traditional methods.
- Facilitates the therapeutic process by visually representing abstract concepts to the users which allows them to easily understand their situation.

2) Designing Virtual Environments for Stress Therapy:

Despite the previous mentioned aspects, VR also altered the sensory immersion, presence, embodiment, and impact, factors that are essential in art therapy. The scope emphasized the need for further research to optimize its usage in future implementations. Therefore, it is necessary to consider the elements used in designing the program that is aimed at therapy. The framework of Zakaria, Ismail, & Yusof (2021) demonstrates a guideline for designing virtual reality suitable for creating a virtual space able to reduce stress.

First, since the brain processes visual stimuli, creating an attention-engaging environment is a key initial step in program design. This includes visually stimulating elements, features, and scenarios. Second, since environment is designed to reduce stress, the designers must add

elements such as natural imagery, soothing colors, and relaxation tools. Third, the environment must have exploration features besides other elements to improve and expand therapeutic benefits. Fourth, preferably, all added elements have the ability to be interacted with to allow the user to have different experiences and behavioral attention. Last, the application must ensure the user's comfort through ease of navigation, clear visual designs, and a supportive atmosphere. These aspects are important to address, along with incorporating both psychological and physical perspectives into technology to ensure the VR can effectively support users in achieving therapeutic goals.

3) Design Thinking and Virtual Reality:

On the other hand, when it comes to innovation enhancement, a user prioritizes the process of understanding existing challenges and generating potential solutions that contain iterative approaches and develop cognitive performance; that is called “design thinking” (Oliveira, Zancul, & Salerno, 2024). Design thinking is considered a catalyst for innovation, offering structured strategies to identify effective solutions to complex problems. Therefore, combining design thinking with VR can significantly boost cognitive development and enable designers to change environmental elements based on evaluation and feedback.

The literature study by Liu, Wang, Ullah, & Memon (2023) emphasized the importance of integrating VR into its practices which will allow participants to interact in a unique environment stimulating creativity and ideation. Moreover, the three-dimensional online space gives a sense of realistic sensory experiences that can enhance user attention and attract them. Stakeholders on that account can add more design elements to encourage the user based on process aspects identification to boost creative thinking and problem-solving. However, design thinking is a skill that needs to be developed with time not only by using traditional methods but by engaging with technologies that stimulate cognitive activity. Young people nowadays tend to rely on technology in almost every part of their lives, which has led to a complex relationship with digital tools.

4) Youth Cognitive Development and Digital Environment:

The book “Youth and the Digital Economy” addresses the challenges the young generation faces while using technology, particularly in contexts such as electricity power malfunctions especially when using high-performance machines and slow-paced development

to keep up with the latest advancements. The majority of young users navigate the online space by creating content that allows them to express themselves such as videos, art, audio, and writing. As such, it is an important part of their expression that is also crucial for their cognitive improvement during adolescence. In order to ensure young individuals can develop their skills through online engagement, it is recommended to let them adapt to various immersive technologies and experience them while giving them the freedom to express themselves without boundaries. By actively engaging, they can familiarize themselves with different elements and tools which will enhance their literacy across different platforms. Similarly, scholars and researchers must take into consideration integrating design thinking principles into designing online applications of VR that allow young people to overcome their challenges, boost mental health, and overcome the challenges they might encounter across multiple platforms.

4. Methodology

4.1 Research Trajectory

This research is positioned in the framework of action research. Simultaneously, examine the process of change in the direct engagement of participants within a practical context. This study emphasizes interventions, reflection, and improvement of adolescent informants who participated in VR art therapy sessions to generate insights into the effectiveness of the therapeutic approach. Therefore, instead of testing a controlled hypothesis in experimental research, this research is focused on how sessions can support emotional expression, creativity, and adaptation strategies. Action research is suitable for this study due to the researcher's collaboration with the participants, observing their progress, and shaping an understanding of how VR technology can be integrated into therapeutic practices.

4.2 Data Collection

This research is carried out in three 3 stages to determine participant receptiveness and engagement with art therapy during the usage of virtual reality space. All stages are conducted on-site, and time is arranged between the researcher and the informant's parents:

1) Choosing Participants:

This research follows a purposive sampling method. Three participants have been chosen based on the researcher's criteria that fit the purpose of this study. The participant's age should be around 10-16 years, struggle with social and mental difficulties, and demonstrate interest

in art practices. In addition, participants must have sufficient familiarity with VR devices, such as VR headsets, and navigate online platforms like Steam or PlayStation Store. Participants must also obtain written consent from their legal guardians prior to their participation in the study.

Initially, the researcher made many attempts at recruiting adolescent participants through wider reach. However, many declines were received due to personal and cultural reasons. Three adolescents identified as proper participants were found in the researcher's neighborhood. The researcher discussed the study with their family, and they approved their engagement. The rationale for this choice is that participants hold relevance to the research focus. The three participants were showing signs of mental and social struggles, within the age required and able to use gaming devices, making them suitable for exploring the therapeutic potential of VR art therapy.

2) Art sessions through Virtual Reality:

The second stage is to immerse participants into the virtual reality space by giving them explanations about how to use the software and tools required for artistic engagement. The researcher provided an orientation and remained present throughout the whole experience. The intended time for each participant is one week of daily engagement with VR. The selected program, CoolPaintVR (available via the PlayStation Store), is a paid application chosen for its diverse features and user-friendly interface. Each session lasts around 1-2 hours, during which the session is recorded, and observation photos are taken.

3) Interview:

The last stage involved interviewing the participants using open-ended questions to collect as much data as possible regarding mental change during the experiment. The purpose is to assess mental state changes before and after the art therapy sessions. Each interview was conducted independently, recorded, and transcribed for analysis. The interview started by acknowledging the user's adaptability and then describing their experience and perceived psychological changes.

4.1.1 Tools and Location:

The location of the study is the participant's home, provided there are no logistical or technical obstacles. Tools are PSVR 1, PlayStation 4, DualShock 4, Motion controllers, and a TV. The gaming setup is owned by the participants, except for the virtual reality headset, it

brought by the researcher. The software used for the VR session is CoolPaintVR from the PlayStation Store.

4.2 Data Analysis

1) Video Recordings:

Visual representation of user engagement with virtual spaces is recorded. Thus, the data in this case are observation notes by the researcher on the subject through unscripted visuals. This kind of data is called "Subject self-reflection," offering insights into user reactions and expressions during unscripted interaction (Penn-Edwards and Sorrel, 2015). Then the researcher analyzed the observation by noting behavioral changes through the experiment. Observation focuses on the factors of emotional triggers, interaction continuation, and user expression. Emotional expressions such as happiness, sadness, anger, and so on can be triggered if the user uses art in a certain way. Interacting continuation refers to the user's desire to feel comfortable continuing the experiment, which may be influenced by unexpected emotional or cognitive responses during the session. The user's expressions are not facial expressions but rather their way of interacting inside the virtual reality, meaning that if the user feels satisfied with engagement, they will produce more content using other features. These observational indicators provided the researcher with the mental situation of the subject and notes on their adaptability with the virtual space.

2) Interviews:

An interview was conducted with the subjects after the virtual reality experience. As such, the data is textual and analyzed through in-depth analysis. First, a semi-structured interview guide was developed to explore changes in participants' mental states before and after virtual reality art sessions. After collecting the respondents' answers, transcribed into a textual format to facilitate systematic documentation and analysis. Then the data was categorized into three segments: subjects' situation before, during, and after the experiment (O'Connor & Gibson, Nancy, 2003). After that, the researcher will try to find themes to connect with the theoretical framework previously discussed.

By connecting results from both observation and interviews, the researcher can identify the potential of art therapy delivered through virtual reality psychotherapy via two types of data. This allowed the researcher to draw conclusions that align with the research objectives.

4.3 Research Schedule

No.	Activity	Date
1	Research period	September 2024 – January 2025
2	Art Sessions through virtual reality	16/8/2024 – 23/8/2024
3	Interviews	2/9/2024-19/9/2024
4	Data analysis and results	20/9/2024-22/12/2024
5	Submission	3/1/2025

Chapter 2 - Mapping the Process: Data Collection and Insights

1. Study Objective:

This single-family case study examines cognitive development and changes occurrence during virtual reality planned sessions, aiming to gain a deeper understanding of the effects of art therapy on the adolescent's emotional and psychological growth as well as therapeutic achievement. This research is based on an inductive approach to analyze in-depth collected data (Creswell, 2005; Yin, 2003) by implementing a structured yet flexible framework for VR art therapy sessions by Hacmun, Regev, and Salomon (2018). This approach is followed by observational analysis of post-experimental interviews with participants to explore their perspective of predicted changes (O'Connor & Gibson, 2003).

1.1 Ethical Considerations:

Participants were chosen after confirming the approval of their parents. During the session, their mother was present and provided information on their behavior and supported cooperation with the researcher. Prior sessions, parents provided background information about their children.

2. Participants' Profiles:

1) Najwan Melaih: A 13-year-old girl who is passionate about dancing, art, fashion, and learning new things. She is the older sister and likes to take on the responsibilities of her sisters. She is also the best in terms of educational achievement among her siblings. Her hobbies are dancing, drawing, and swimming. She struggles with anxiety, depression and often feels discouraged when she fails to achieve a certain goal. This year she was planning to be the first in her class, but she took the seventh which made her feel frustrated, down, and depressed. Her mother also described her as introverted and not having many friends due to her belief that she could not find peers who shared her interests or personality traits.

2) Nouran Melaih: A 12-year-old girl who likes to dance, listen to music, and play video games. Contrary to her older sister, Nouran doesn't like to learn new things and doesn't care if she can't achieve a high score in school. She maintains her own social circle and is open to forming new friendships of her age. She struggles with anxiety and a lazy lifestyle that limits her physical activity. Her skin is full of pimples and has an overweight issue. Although she has not been with a certain illness, her doctor pointed out that to pay attention to her mental condition, as it might be the cause for her physical issues. Her anxiety, low self-esteem, and

depression, as noted by both her parents and physician, are considered uncommon for her age group.

3) Haneen Melaih: A 10-year-old girl who likes to dance, draw, sing and is interested in K-pop culture. The youngest girl has no strong connection with her sisters. Her mother expressed the difficulties and challenges of parenting her, noting that she is the most stubborn, insubordinate, and defiant. Despite her tough personality, she has been struggling with constipation since birth which requires a long-term treatment plan. Meanwhile, she doesn't listen to her parents' guidance easily and has concerns to deal with.

2.1 Reasons for Participants' Preference:

Melaih family consists of 13 members living in Jeddah, KSA, across 3 different households. Each household has its social difficulties that require attention. The three selected sisters have sisters of the same age from the same father, and they have similar difficulties according to their guardians. The participants live with no other family members in the same household and have their own PlayStation VR set up along with their mother's support. To assist the research aims, the results would assess the effectiveness of the intervention in comparison to other sisters of the same age who have the same parenting guidance but reside in different households.

In their childhood, Najwan was the first female child in the family and initially received significant attention, which later decreased as younger siblings were born. She had been spoiled in her early years and could get whatever she wanted. However, this level of attention is no longer available, and she perceives this shift as a form of neglect. Haneen is the youngest and has suffered from intense constipation since birth. Since her diagnosis, the doctor has advised the parents on her psychological condition, which has proven challenging to manage. As a result, she shows constant signs of anger, stubbornness, sadness, and loss of appetite. She had a habit of sucking her thumb finger which caused a tooth eruption advancement. Her mother enrolled her in a private mental therapeutic clinic. At the time, her mental health improved but recently began to show signs of resistance to academic engagement. Nouran on the other hand, felt lost in between, arguing that her parents don't give her the same amount of attention compared to her sisters. This has led her to seek emotional support from her sisters, peers, and online communities. Her mother expressed concern about her laziness, noting her

reluctance to participate in any activity, and feared that this lifestyle would cause her mental and physical issues.

While all sisters suffer from a lack of proper social interaction, low self-esteem, and confidence, they achieve high grades in school. In their households, they find it hard to accomplish simple daily tasks, finish their homework, maintain proper nutrition, and frequently engage in arguments. While they practice their hobby, they rarely go back to enhance their skills or feel joy in what they do. Their addiction to mobile phones makes them resistant to completing chores and reluctant to leave the house. They have a PlayStation gaming device along with the first version of PSVR, which provides an accessible platform to utilize available tools, combining a hobby with potential psychological benefits.

3. Session Design:

In this research, virtual reality experiments were conducted offline in the participants' house using their gadgets and with their mothers' assistance. The art therapy sessions are divided into 8 sessions, each one will last for approximately 60 minutes. An extra introductory session for teaching the participants how to use the art tools within the virtual space.

- Session 1: An introduction to CoolPaintVR

Session 1 served as an introduction to navigating the CoolPaintVR application, focusing on familiarizing participants with the tools and control the virtual environment. To build trust, the researcher and the participants explored the virtual space together, experimented with the tools and took turns creating first pieces. Participants welcomed the idea of using an artistic application in a usual gaming set-up.

Najwan was amazed that she could create 3D art compared to traditional practices, expressing the ease of using brushes, erasers, and shape tools. She created her first art and remarked, “Never thought I would be satisfied with the first trial.”

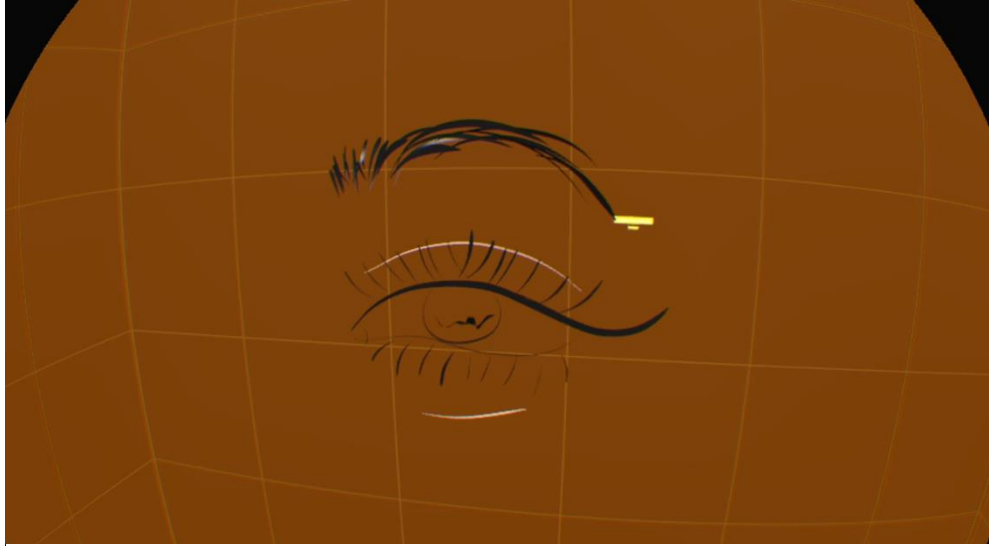


Figure 1 “The Eye” first art creation Najwan did
(Source: Najwan’s digital drawing)

Nouran, however, struggled to adapt to virtual space easily. She experienced difficulties moving the controller easily. The brushes, on the other hand, have to be pressed gently to control the thickness. For her, it’s either too thin or too thick, and she was unable to adjust the flow. Following her older sister's steps, she decided to create an eye but was not satisfied with the result, saying, “It looks like a monster eye, if I continue like this, I will create the ugliest pieces”. The researcher reassured her that this is part of the adaptation process and encouraged her that she would improve next time.

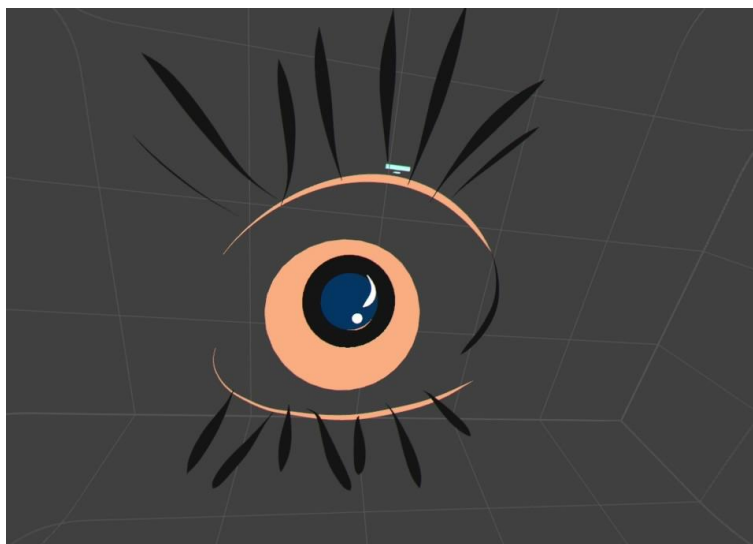


Figure2. Nouran’s first art creation - 1st session
(Source: Nouran’s digital drawing)

Haneen, on the contrary, was the fastest to adapt to controllers. She was amazed by how the flow of the brushes easily modified. The features were easily accessible and seamlessly integrated into the environment. Once she saw the panel, she said “I will create here my own room and I will fill it all with my lovely stuffed toys”. She created her first piece of art satisfied and expressed eagerness to continue in the next session.



*Figure 3. Haneen's first art creation - 1st session
(Source: Haneen's digital drawing)*

- **Session 2: Identity Conceptualization.**

The second session focused on expressing each participant's perception of themselves through artistic creation, using representations such as a character, emoji, symbol, and so on. To better understand the participants' emotional states, the researcher facilitated a discussion on self-concept and how they identify their presence. To express it in art, the researcher told the sisters that the value of oneself differs from how they perceive it based on their collected perceptions. In online spaces, individuals typically select avatars that closely represent aspects of their identity. Therefore, when creating a self-representation, individuals tend to choose images that reflect how they see themselves from their perspectives.

Najwan started by expressing that she was unsure how to represent herself artistically. However, she expressed a desire to be illustrated by professional artists as a lovely anime character. She created a female avatar that resembled how she imagined she would be perceived by others.



*Figure 4. Najwan's expression of self-conceptualization art - 2nd session
(Source: Najwan's digital drawing)*

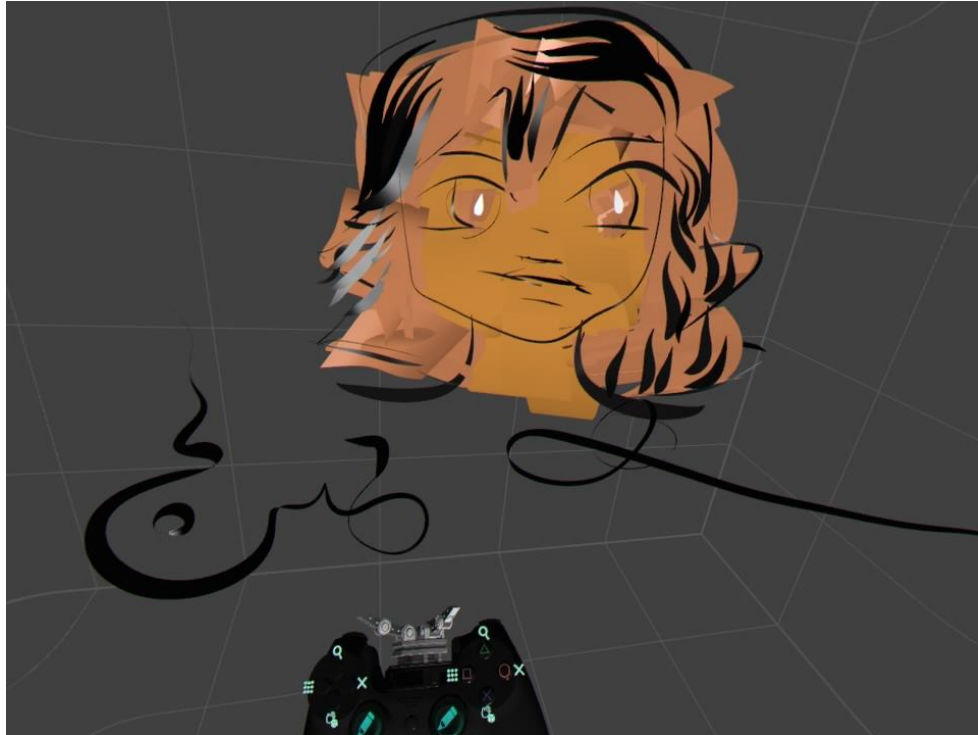
Nouran, when asked the same question, stated that she rarely considers representing herself verbally. She noted that even in artistic activities, she does not typically choose themes or styles that reflect her identity. In the online world, she said she always chooses a female avatar. From her perspective, all female avatars appear visually similar, and she wouldn't mind if she chose an icon that does not resemble her face. She drew a typical avatar commonly

found in widely used applications. “I would like to be known by a similar avatar by others, If I can choose it for my formal photo, I will approve it,” Nouran said.



*Figure 5. Nouran's avatar art – 2nd session
(Source: Nouran's digital drawing)*

Haneen said she likes to be represented in a way that closely resembles her appearance. She emphasized that she consistently draws herself without using symbolic representations. She has a collection of drawings of people expressing that she always perceives others by their looks. When she asked the same question as her sisters, she would give them the same image of herself. She emphasized that she does not prefer any fictional or stylized resemblance. Immersing herself in the application saying that she will choose it in the online space too. She created a signature of her name next to her artwork, reflecting a strong sense of self-confidence.



*Figure 6. Haneen's self representation art - 2nd session
(Source: Haneen's digital drawing)*

- Session 3: Dreams

This session aimed to explore each participant's aspirations by asking them to represent their future goals or personal dreams through artistic expression. The future aims are a factor in determining the psychological state of the sisters. Within the VR realm, the ease of creating artwork reduces the hustle of expressing oneself (Hacmun, Regev, & Salomon, 2018). Therefore, in this session, the researcher asked the participants to shape a dream and explain its importance.

Najwan said she has multiple dreams and can't state them all in one conversation. She has already achieved a dream of being one of the top ten best students in her class. Even though she couldn't achieve the first place, she determined to work hard this semester to make it happen. Thus, she is currently focused on short-term dreams, acknowledging that over time long-term dreams might change. She is influenced nowadays by famous YouTubers such as BanderitaX, AboFlah, and Mr. Falafel. She wants to start streaming gaming content soon and then portray herself as a well-known female streamer.

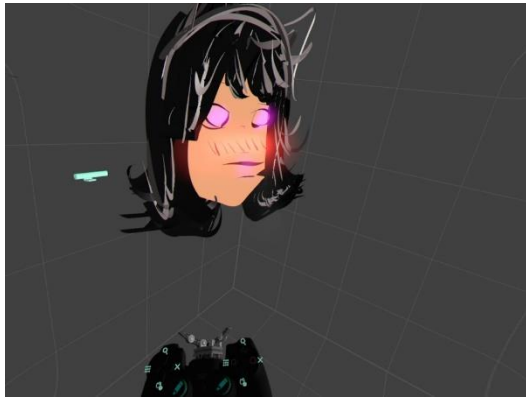


Figure 7. Najwan's Streamer dream art – 3rd session
(Source: Najwan's digital drawing)

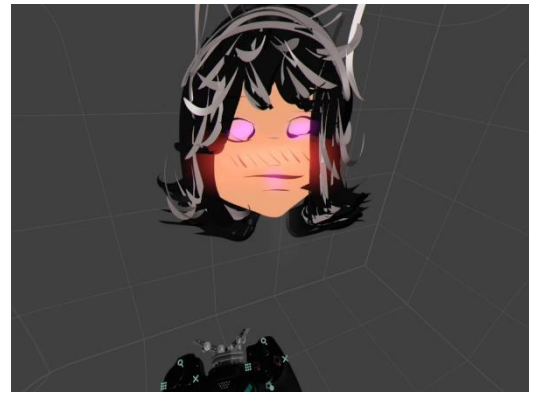


Figure 8. Najwan's Streamer dream art – 3rd session
(Source: Najwan's digital drawing)

Nouran stated that she has been dreaming of creating a stunning story by refining an existing one. As a big fan of “The Amazing World of Gumball” show, she wanted to incorporate elements of horror fantasy into her artwork. She draws two books one with a Gumball title and the other with a “monster world” title. When she was asked why she separated the story, she answered that she planned to create two stories that connect with each other through similar worlds.

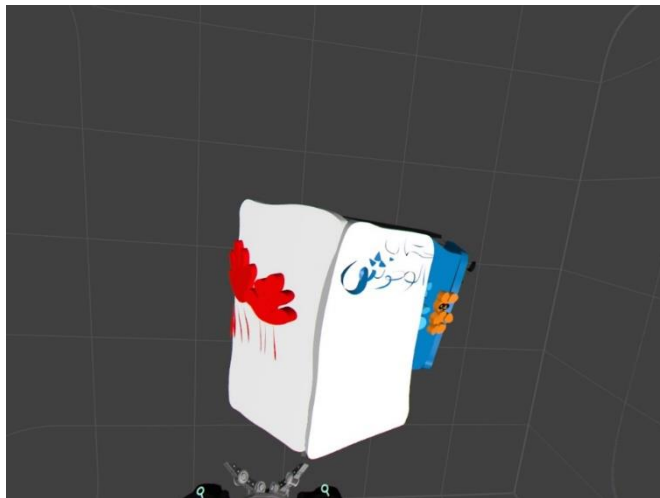


Figure 9. Nouran's book art – 3rd session
(Source: Nouran's digital drawing)

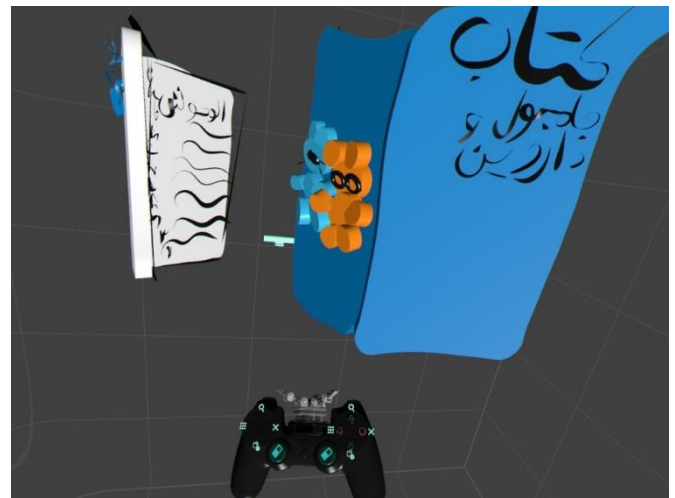


Figure 10. Nouran's book art – 3rd session
(Source: Nouran's digital drawing)

Haneen, the optimistic dreamer, described several aspirations for her future. Recently, she has been achieving high scores in school, which constitutes a significant improvement for her compared to the previous semester. She said the reason was that her teachers were patient and cooperative, considering her health status and its effect on her mood during class. In addition, influenced by her teacher, she decided to become a teacher. She drew a scene depicting a classroom with students and herself.

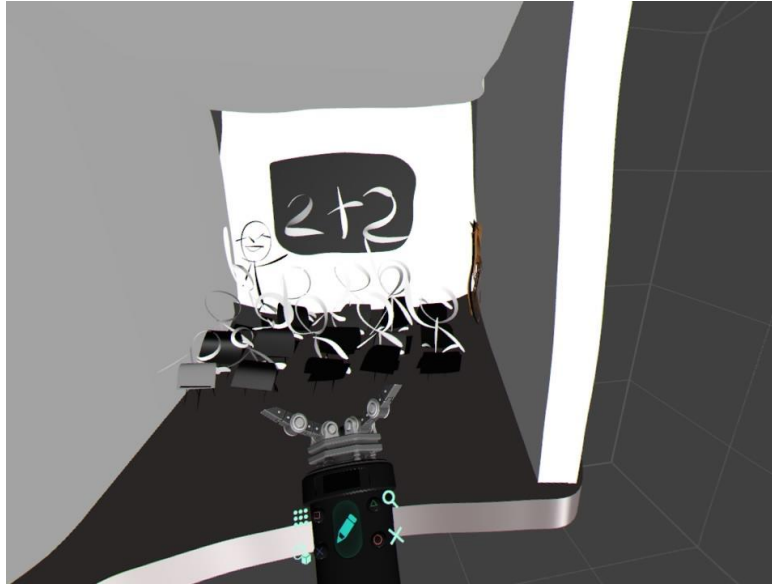


Figure 11. Haneen's classroom art – 3rd session
(Source: Haneen's digital drawing)

- **Session 4: Relationships and Identification of Connection**

The fourth session focused on how participants perceive their close relationships with family, friends, and community. The participants reflected on their experiences of social support and interpersonal dynamics of relationships.

Najwan, who is described by her mother as the most isolated sister, perceives herself as not so close to her sisters. While discussing with her, she expressed feeling lonely most of the time. Despite her solitude, she portrayed her sisters as mountains explaining that they are storing and capable of handling difficult conditions.

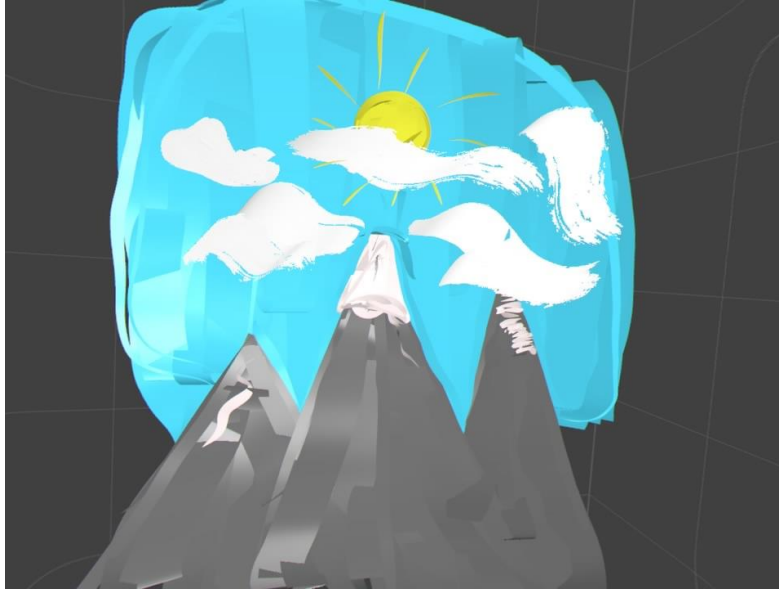


Figure 12. Najwan's Mountain art – 4th session
(Source: Najwan's digital drawing)

Nouran, in contrast, represented her sisters as colored cubes. She explained that this imagery reflected her perception of her sisters as closely connected and memorable figures in her life. She compared them to popular sister cartoon characters, “The Powerpuff Girls”.

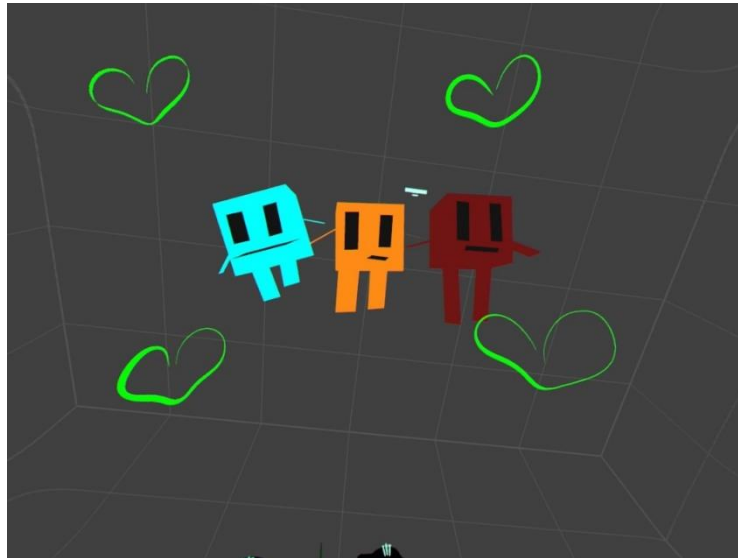


Figure 13. Nouran's art of herself with her sisters art – 4th session
(Source: Nouran's digital drawing)

Haneen mostly picks nature elements to represent her themes due to her perception that nature can bring forth meanings. She chose a tree to represent herself and her sisters, explaining that it symbolizes beauty, usefulness, and interconnectedness through its roots.

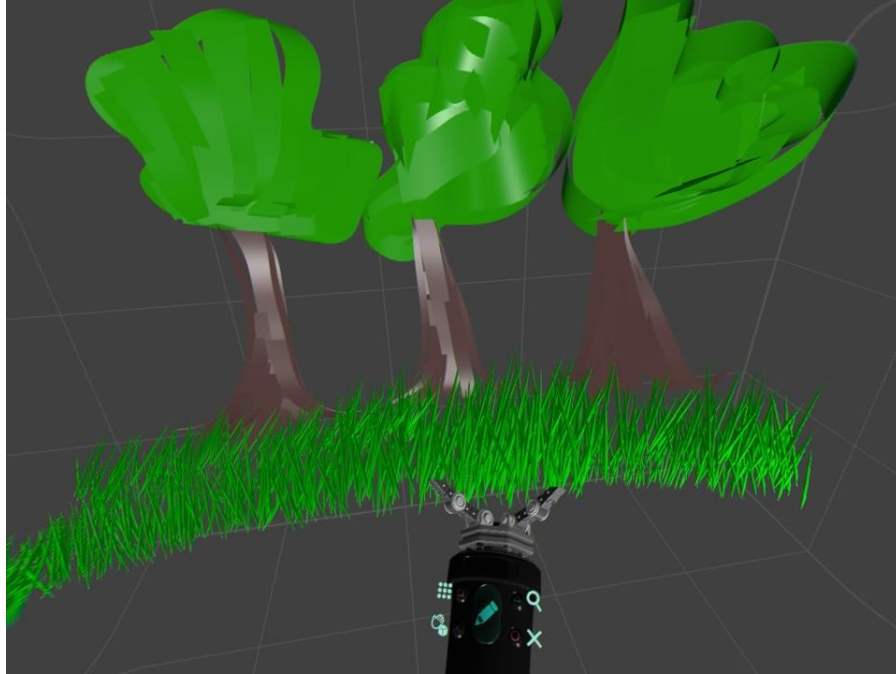


Figure 14. Haneen's tree art – 4th session
(Source: Haneen's digital drawing)

- **Session 5: Emotional Expression**

This session focuses on exploring and expressing emotional states. The participants express their feelings by visually representing them in their artistic creations. Whether it's recent or old emotions, the focus on letting the person express their feelings in a private and safe environment provided has a relief effect. The researcher asked the participants what they had experienced lately and what their triggers were.

Najwan expressed that she feels stressed lately due to her study burden. She attempted to relieve stress through dancing, but anxiety returned once she resumed studying. She expressed her anxiety in an artwork depicting black rays emanating from her head. She explained that the black rays emanate behind her head because it is invisible to others. In her artwork, she included a pool as a symbolic representation of relaxation, comparing it to the calming effect of taking a warm bath.

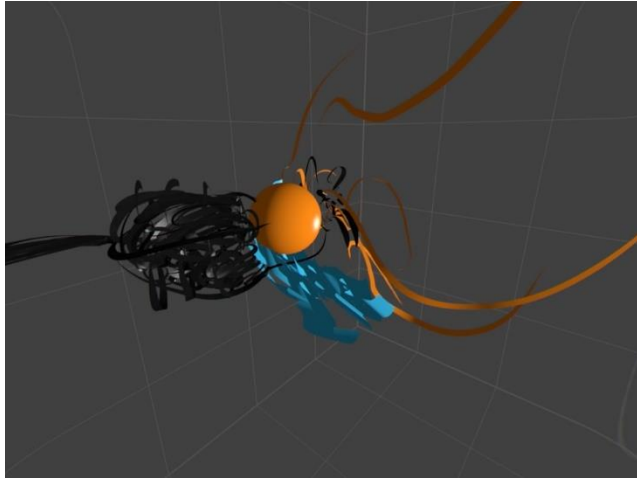


Figure 15. Najwan's art of emotional expression art – 5th session
(Source: Najwan's digital drawing)

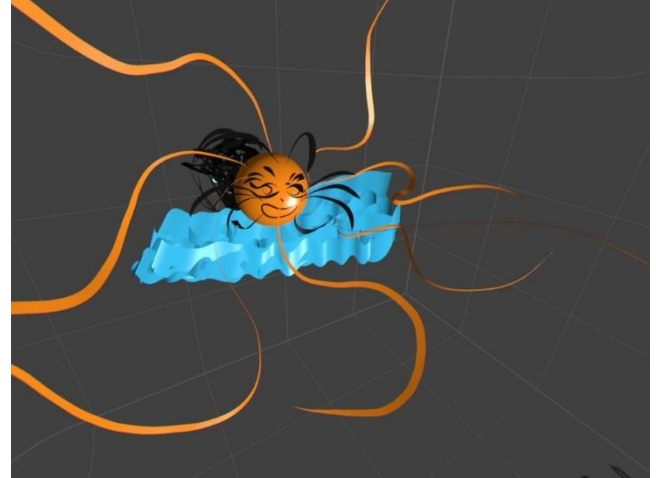


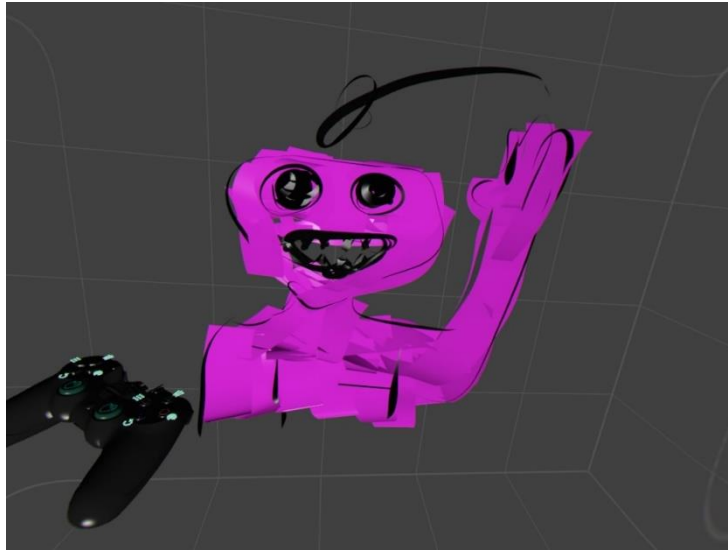
Figure 16. Najwan's art of emotional expression art – 5th session
(Source: Najwan's digital drawing)

Nouran recently changed her hairstyle. She dyed the ends of her hair pink. Her friends and siblings told her that she looked good. Her confidence improved, and she reported feeling happier. What the researcher noted was that this cheered her up to express herself more in this session. Thus, Nouran associated the color pink with happiness, indicating that it now represented her emotional state. She drew a happy cupcake, which is her favorite dessert, in pink color with a smiling expression.



Figure 17. Nouran's cupcake art – 5th session
(Source: Nouran's digital drawing)

Haneen expressed that she had been having nightmares recently after she watched an online horror game called “Poppy Playtime”. She was deeply affected by the main villain's appearance, which initially seemed friendly. Haneen drew it as a friendly figure waving to her to help her confront her fears.



*Figure 18. Haneen’s game character art – 5th session
(Source: Haneen’s digital drawing)*

- **Session 6: Overcome Challenges and Difficulties**

In this session, the participants were asked to visually represent the challenges they face and demonstrate their resilience in coping with adversity. At an early age, they can describe their struggles through imaginative visual representations, followed by depictions of emotional relief.

Najwan started by describing her struggles as intense weather. Since they live in a desert region, she described the challenge of walking to school in extreme heat, explaining that she continued to endure it. She related this experience to broader life challenges, explaining that difficult situations can be endured and eventually overcome through patience and time. She illustrated this metaphor through an image of a huge ship enduring the intense weather through the sea.



Figure 19. Najwan's ship art – 6th session
(Source: Najwan's digital drawing)

Nouran described the struggles of her life as an ongoing storm. Sometimes it continues to never settle, only gradually disappear over time. She connected that to experience with weight-related bullying at school, explaining that while such comments once affected her deeply, she is now emotionally unaffected by them. In her artwork, she depicted the storm as a representation of her ongoing struggle and then drew a ribbon as herself now gaining confidence and resilience.

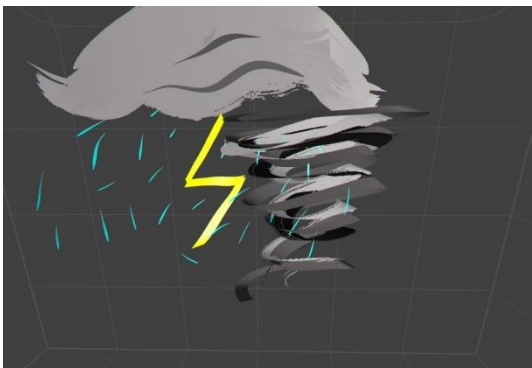


Figure 21. Nouran's storm art – 6th session
(Source: Nouran's digital drawing)

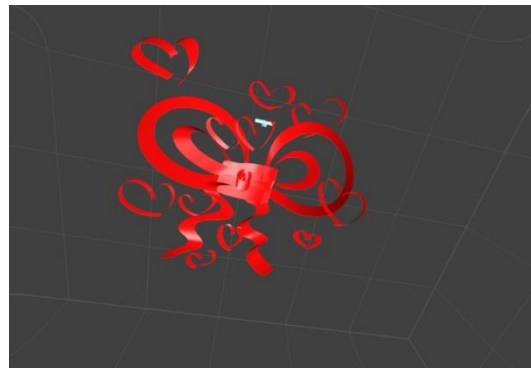
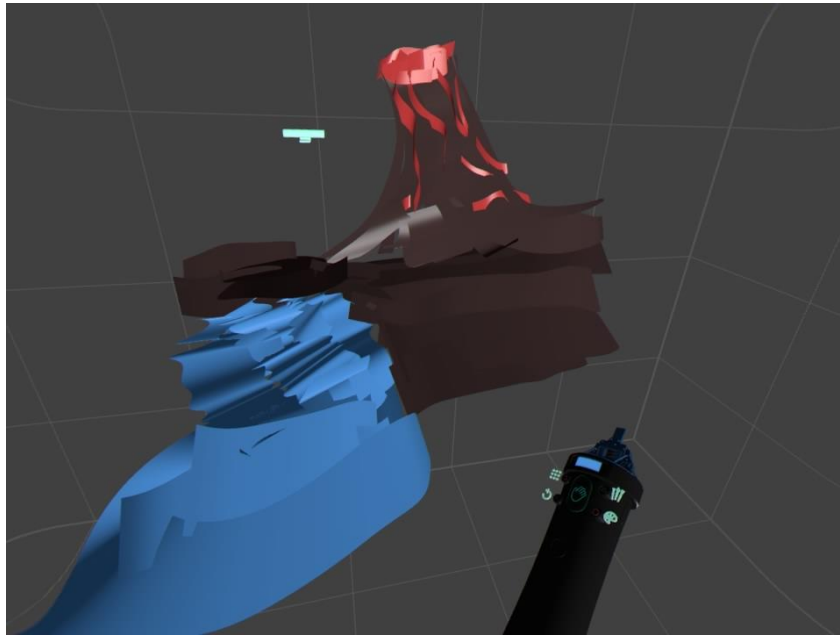


Figure 20. Nouran's ribbon art – 6th session
(Source: Nouran's digital drawing)

Haneen has been struggling with an intense health condition since birth. As it's a sensitive matter to her, her mother assists her by helping her articulate the experience and encourages her to express it through art. She described it as holding pain for a long time, followed by the unexpected release of that burden. She compared the experience to a volcano that contains lava for a long time before erupting, followed by the calming presence of a river.



*Figure 22. Haneen's volcano art – 6th session
(Source: Haneen's digital drawing)*

- Session 7: Nature, Surroundings, and Environment

This session is aimed at assessing the participants' ability to imagine a specific environment, including surrounding objects and their perception of nature. Assessing virtual and artistic skills through the creation of more complex scenes also enhances creative performance, which may contribute to psychological development.

Najwan had many items in her mind and drew several objects such as an ice cube, flower, fire, and a hand controller. She then deleted them, choosing to focus on creating things that look more challenging and appealing. Firstly, she drew a mushroom, which she considered one of her favorite elements in nature. Then she decided to change it into a house. She expressed that the world has infinite possibilities, and we can control where we want to live, especially in a virtual world.



*Figure 23. Najwan's mushroom house art – 7th session
(Source: Najwan's digital drawing)*

Nouran said a house is a typical living space and that it is easy for her to imagine what it is like to have a future house. "For me, a house means having a comfortable place to stay for a long time," Nouran said. She preferred to choose houses rather than any other environmental elements because they felt the most personally meaningful to her.



Figure 24. Nouran's house art – 7th session
(Source: Nouran's digital drawing)

Haneen said her favorite sight is any place filled with fruits. Expressing fruit farms is the best type of nature. "If it were possible, I would turn a whole garden into a cherry blossom farm." Haneen said. She drew a landscape filled with cherries.

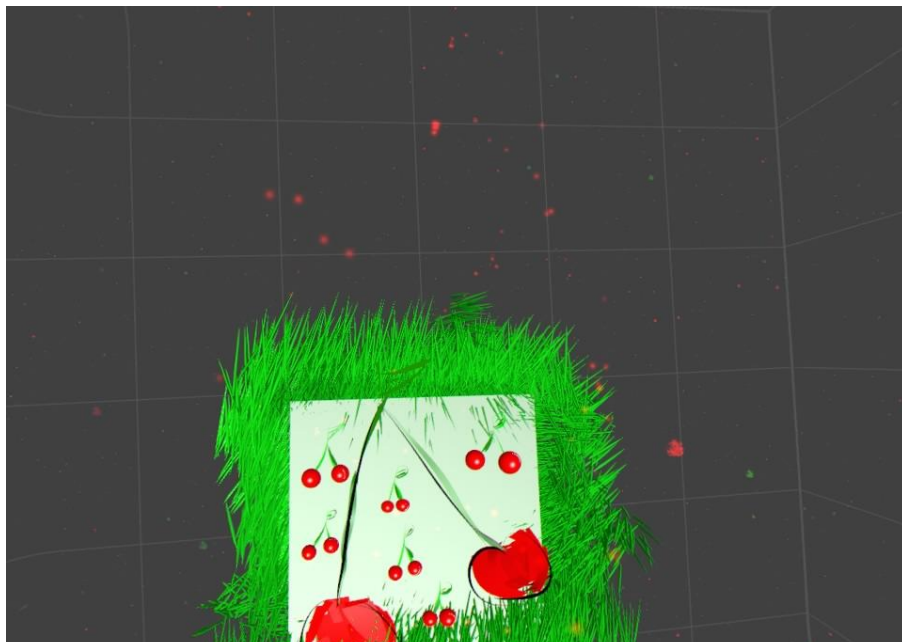


Figure 25. Haneen's cherries art – 7th session
(Source: Haneen's digital drawing)

- **Session 8: Free Art (Personal Growth Reflection)**

The last session reflected creativity enhancement as well as the ability of the participants to independently create imagery experiences. No specific theme was assigned, allowing participants to feel a sense of accomplishment. This approach contributed to improved self-esteem, reduced symptoms of anxiety and depression, and increased self-confidence. It also fostered a sense of satisfaction and enhanced digital literacy through engagement with new technology. Additionally, the experience has the potential to be integrated into a regular routine for continued therapeutic benefit. The participants were excited to draw and had many ideas desiring to portray.

Najwan was excited to draw her last painting, drawing a parallel to a recent family gathering with her siblings. She explained how joyful it was to reunite with her family and share recent experiences, including her participation in the VR art therapy sessions. She reported feeling more open in expressing herself, and sharing artwork makes her feel good. She drew a dining table with food at the center, surrounded by chairs.

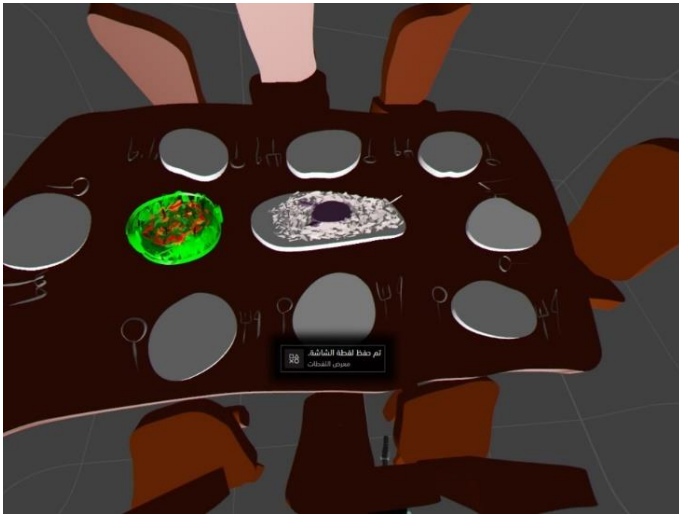


Figure 27. Najwan's family dining gathering art – 8th session
(Source: Najwan's digital drawing)

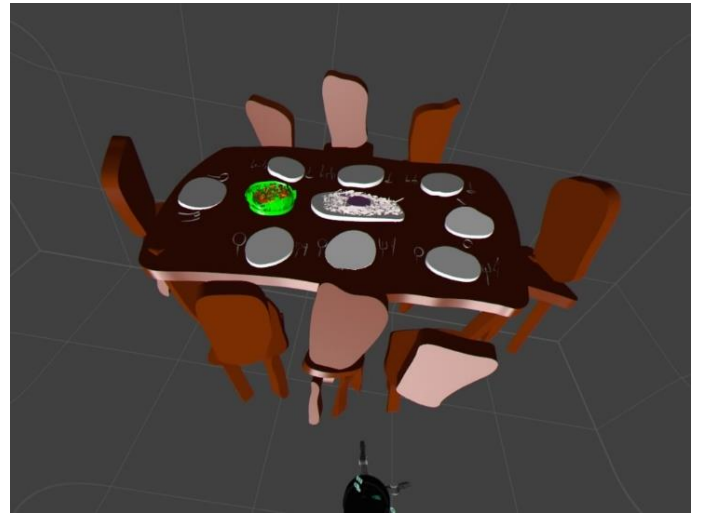


Figure 26. Najwan's family dining gathering art – 8th session
(Source: Najwan's digital drawing)

Nouran expressed a high level of satisfaction after mastering the tools compared to the first session. The ease of creation allowed her to effectively communicate her ideas and share them with others. She illustrated a key event from her planned story using a fantasy-themed scene featuring a sword and swirling effects. She also wrote the word "night" in English in one corner, explaining that the VR art environment provided an opportunity to practice and reinforce English vocabulary.

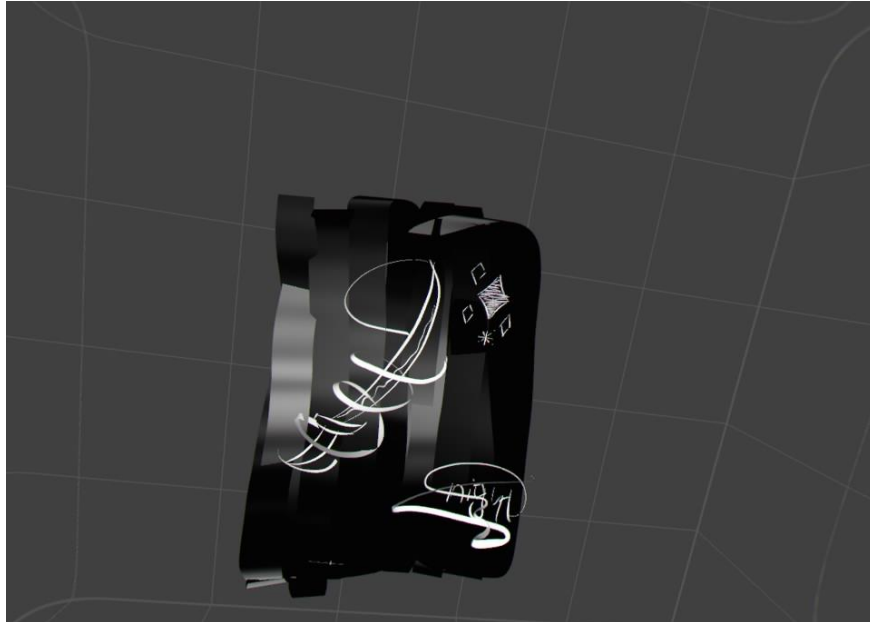


Figure 28. Nouran's magic sword art – 8th session
(Source: Nouran's digital drawing)

Haneen was excited to draw many of her imaginary fantasies, expressing the joy of feeling it can resemble reality as 3D art. She drew an ice land where someone built snowmen and made friends with a living ice creature. This scenery is not only proof that her mental health improved but also indicates progress in her communication skills and emotional openness.



Figure 29. Haneen's ice land art – 8th session
(Source: Haneen's digital drawing)

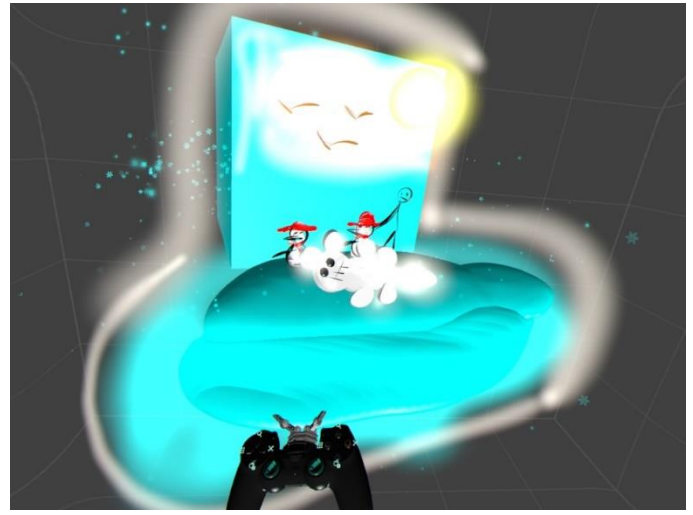


Figure 30. Haneen's ice land – 8th session
(Source: Haneen's digital drawing)

Chapter 3 - Unveiling Patterns: Data Collection, Emerging Themes and Therapeutic Outcomes

3.1 Findings and Discussion:

By analyzing the themes given to participants and observing their behavior and interaction with the application. A minor 6 sub-themes that can be concluded to determine the effect of VR art therapy are “Mechanism of emotional expression and coping”, “self-representation”, “social opening”, “future aspiration”, “adaptation of virtual reality”, and “Creative Freedom” (Hacmun, Regev, & Salomon, 2018).

1- Mechanism of Emotional Expression and Coping:

The virtual reality space provides the user with the opportunity to express eliminating the need to hear feedback unless asked for. The user can feel close to reaching accomplishments and raise satisfaction without verbal guidance (Zakaria, Ismail, & Yusof, A.M, 2021). Although professional orientation is needed in some cases, individuals who prefer to express themselves without order are more likely to be encouraged and welcomed (Shukla, 2022). The participants have shown signs of independence in terms of emotional expression in sessions 5, 6, and 8. They could alter psychological aspects into 3D art thus increasing the visualization of emotion. Besides any other practical hobby, VR art therapy brought a break from reality, especially stress and anxiety experienced on a daily basis. The participants have expressed their relief when they enter a non-reality world. To begin with, Najwan draws a circle with black beams reflecting the overwhelming to being trapped in her struggle. Nouran shapes her optimistic yet humorous traits into a smiling cupcake. While Haneen faced her fears by altering a horror character into a friendly one. in the 6th session, Najwan draws a ship into a storm and navigation through tough situations showing determination to move forward. Nouran symbolizes storm and ribbon as a combination of chaos and beauty showing her balance when facing her problems. Haneen's volcano turns into a river illustrating a transformation from intensity to calmness, showing that she has the ability to pass. Lastly, Mushroom House refers to seeking a safe place as a desire for comfort and coping. Nouran's house surrounded by trees and butterflies reflects harmony and growth expressing the peace and progression to deal with emotional hustle. Haneen Cherry Garden depicts emotional resolution through the symbolism of beauty and serenity.

Najwan related to the illustration of how VR allowed her to channel emotional relief and happiness in a creative approach as she says, “Proud and relaxed, letting out thoughts and feelings through art”. Haneen followed Najwan’s perspective when she said, “Excited, energized, and proud of my new routine,” anticipating that positivity and a safe place created an emotional exploration. “More confident sharing ideas and less scared to try new things,” Nouran said, indicating she receives insights into therapeutic facilitation and empowerment to navigate challenges while continuing to develop.

2- Self-representation:

The online world lets people use features without revealing their true identity giving them the chance to act without being judged. In addition to creating a desired self-image precepting certain preferred traits (Vanesa, Pérez-Torres, 2024). The same aspect is applied to the virtual reality world when a person given a non-real world can create themselves within it. Self-representation is an essential factor in terms of maintaining self-confidence, especially for young people who are easily affected by social media standards. Therefore, the ease of implementing a representation of oneself reflects on confidence, optimism, and passion they can be (Shamri Zeevi, 2021) (Jinkyung Kim and Yeo Ju Chung, 2024) (Hacmun, Regev, & Salomon, 2018). In sessions 2, 3, and 5, the participants have shown a willingness to represent themselves in various visions. They made an impact on self-representation in the virtual world that naturally increases satisfaction and social opening. In the second session, all the participants drew a digital avatar of themselves, demonstrating their individuality and how they perceived themselves. Their way of shaping the drawings shows their methods of introducing themselves into the virtual space, evolving the sense of identity (Fonseca, 2022). Nouran reflects the optimism when she draws her image, connecting it to a smiling cupcake. While Haneen embraced her future dreams to desired to become a teacher in her classroom art in the 3rd session.

The relevance provided in participant responses expresses their individuality, values, and creativity. Najwan related to this when she said, “Separate world of creativity; relieved and happy” and “Although I enjoyed VR art, I prefer traditional art due to the ability to use a variety of tools and trying different types of art,” indicating her reflection of rich sensory experiences and self-representation of hand-on creativity. Nouran reflects her

creativity through a novel way of passionate individuality as she says, “Super creative, got to try something new” and “More confident sharing ideas and less scared to try new things”. Haneen's responses shed light on how VR art therapy sessions allowed her to represent herself in a new medium and show openness, innovation, and self-discovery in her responses: “Tried new technology, had fun, felt relief” and “My art passion acquired a new aspect, and I feel more open”.

3- Social Openness:

The addiction to technology nowadays leads people to choose to stay alone rather than attempting to make new acquaintances. Social distancing overwhelms adolescents due to a lack of routine interaction in person. Limitation of interaction hinders the healthy growth of communication skills which leads to difficulties in social engagement (Vanesa, Pérez-Torres, 2024). To ease emotional outlets, it's essential for young individuals to practice innovative therapeutic approaches. It can foster emotional resilience, creativity, and satisfaction (Shukla, 2022). In sessions 4, 7, and 8, participants expressed the joy of sharing their latest life events with friends and family members. Seeking a community to share their artwork with and aiming to feel the happiness of sharing new experiences with others. While in the 4th session, Haneen's Trees often refer to family and interconnections. The tree growth signifies social bond exploration. Nouran's House in session 7 which reflects into safe inviting space suggests liveliness and interaction conveying openness to nurturing relationships and allowing others to enter personal space.

Demonstration of increased comfort, confidence, and willingness to share can be seen in the parents' feedback that girls who engaged in this experience showed enhanced communication and mental engagement compared to their siblings. Nouran's answer was “More confident sharing ideas and less scared to try new things,” highlighting that the experiment assisted her to overcome hesitation and raised expression which improved her social openness.

4- Future Aspirations:

Creativity's correlation to the future elaborates the expression of a forward-looking mindset, self-motivation, and goal setting. As such, translating abstract ideas into art forms could bring forth focus on personal goals, giving a strong desire to work hard. When creating a certain art as a resemblance to future achievement this served as a

motivational exercise, hence connected to life actions (Runco & Pritzker, 2020). The significance of adolescents can improve their emotional state and reduce anxiety and depression (Shukla, 2022). In the 3rd session, the participants visualize their ambitions through symbolic representations, such as a "classroom" indicating academic success or a desire to teach, a "book" potentially reflecting a passion for knowledge or creativity, and a game referring to admiring self-growth. Their perception of the future incorporates resilience and self-determination.

Observing the participant's responses showcasing the VR art therapy inspired them to pursue personal and creative growth, which boosted innovation as well as future endeavors. Haneen, when she said, "My art passion acquired a new aspect, and I feel more open," as an instance is a form of aspiration to keep on exploring art making her potential to integrate innovation through digital mediums.

5- Adaptation to New Technology (Virtual Reality):

When it comes to emerging new technologies, time is needed to learn how to use them and the desire to rely on them to do important tasks. Due to the advancement in technology nowadays, people can comprehend all the information easily through the internet. Virtual reality is not a new technology but its interference to be a reliable device for practice is a new approach (Kennedy, Reed, & Wamboldt, 2014) (Hacmun, Regev, & Salomon, 2018). The participants have shown an easy engaging experience of the nature of VR. Starting with the introductory sessions when they navigate and utilize the application. Although Nouran expressed her disturbance with control she adapted to it easily with time. The sessions afterward demonstrated their skills have grown better, indicating a high skill in mastering the tools. They felt connected and present which is a crucial factor for adolescents who suffer from anxiety and social issues.

VR art therapy experience is a new approach for the participants. As such, they expressed how they have been able to transition from initial challenges to mastering VR tools. Najwan says, "Controllers lagged; making small details was challenging." Nouran says the same thing, and Haneen, "Using the VR tools was tricky at first," indicating that all of them faced usability difficulties but with the experience going they adapted quickly and used the tool as a tool for growth.

6- Creative Freedom:

The term refers to the unlimited exploration of artistic potential without typical constraints physical mediums offer such as certain canvas spaces, can't undo mistakes, and tool unavailability. The ease of controlling a variety of tools, spaces, and colors gives the ability to create beyond traditional boundaries. Therefore, creativity skill is improved indicating that conveying the inner world is easier to express raising emotional release (Hacmun, Regev, & Salomon, 2018) (Cohen-Yatziv & Regev, 2019) (Shamri Zeevi, 2021). During sessions, it can be noticed that creativity has improved. By comparison of the first session and last, the participants significantly enhanced in performing authentic pieces. Arts in the last sessions have more objects compared to other creations, showing that participants foster deeper connections with their art resulting in raising confidence and successful self-expression. Nouran's smiling cupcake in the 5th session used a variety of shining colors, playful and unconventional symbols to depict thinking outside the box. Haneen's ivory cube in the 8th session was created by a 3D cube paying attention to details such as colors, elements, and creatures, indicating VR's flexibility and unrestricted imagination. Najwan's mountains in the 4th session details showing a close to realistic nature scene illustrating unlimited creativity in reinterpreting the perception of nature. The expression of an appreciation for exploring freely and fostering creative growth can be seen in Haneen's answer, "Digital art is preferable because it's easy to use and free to commit mistakes," showing that VR art encourages taking risks. As Nouran says, "Curious and amazed, felt isolated in a separate world," illustrating immersion and detachment from reality unlocking a separate level of creativity. While Najwan says, "Although I enjoyed VR art, I prefer traditional art due to the ability to use a variety of tools and try different types of art," she suggests the value of VR's creative potential while embracing the sensory and hands-on experience of traditional art.

3.1.1 Bridging Challenges and Creativity: Insights into VR Art Therapy Outcomes:

An interview was conducted with the participants after the sessions using open-ended questions such as what, when, and how to identify exploration of emotional expression, creativity, and adaptation in VR art therapy.

Participants faced challenges and initial difficulties with VR tools and controls. As a recent medium to deal with, it's predictable to face lag and disturbance especially since the tools used are old versions. Despite such issues, the girls surpass with great improvements.

The middle child had the most who faced difficulties starting in the first session and said, “Hard to draw exactly what I imagine.” While Haneen said, "Using the VR tools was tricky at first," She was the fastest to adapt. And Najwan said, “Controllers lagged; making small details was challenging”.

On the other hand, enjoyment and curiosity have been experienced during the VR art therapy sessions. The participants express that through their answers of “Had fun and felt my skills grown better”, “Curious and amazed, felt isolated in a separate world”, and “Focused and excited, enjoyed experimenting with tools”, illustrating that art therapy succeeds in bringing optimism and delight. In addition to an appreciation of the interference of a new medium embracing innovation and creativity. When the girls were asked to describe their experience, Haneen answered, “Tried new technology, had fun, felt relief”, Nouran answered, “Super creative, got to try something new”, and Najwan “Separate world of creativity; relieved and happy”.

Traditional art such as paintings, sketching, and coloring using different types of tangible tools has proved successful in terms of emotional expression and creativity exploration in a therapeutic environment (Arslanbek, Malhotra, & Kaimal, 2022). However, the VR world gives a fictional space where users can create unreal objects. Such an experience drives curiosity and excitement. The participants shared their preferred art practice method between traditional and digital. Haneen preferred digital art because it's easier to navigate. “I like traditional art in terms of tangible elements, while digital art is preferable because it’s easy to use and free to commit mistakes,” Haneen said. While Nouran expressed her traditional art passion compared to the digital world, she can use a variety of tools. “Digital art feels easier because I can undo mistakes, and there are so many cool tools to use”. Although Najwan pointed out the ease of use of tools in the digital realm, it lies under the technical error threats so she preferred practicing traditional art because she can keep the piece. “Although I enjoyed VR art, I prefer traditional art due to the ability to use a variety of tools and try different types of art”. Such responses indicate a balance between enjoying VR art and preferring traditional art especially when it comes to sensory factors that the digital realm lacks. The VR space provided tools, excitement, unrealistic yet felt elements, and skill improvement.

To detect personal growth and creativity improvement through digital art therapy. participants were asked about the changes noted in their behavior. Haneen answered, “My art

passion acquired a new aspect, and I feel more open.” Nouran said, “More confident sharing ideas and less scared to try new things,” and Najwan said, “Innovative ideas are flowing; creativity raised like never before”. The experience has prompted the reflection of art therapy's influence on their mindset and improved their creativity level. Highlighting the personal development and increase of self-esteem in expressive capacities. Following the feeling of pride and satisfaction when they answer the questions of how they feel prior to the sessions “Excited, energized, and proud of my new routine”, “Felt proud and relaxed”, and “Proud and relaxed, letting out thoughts and feelings through art”.

Overall, the experience reached the required aim of therapeutic goals through CoolPaintVR with the participants showcasing significant signs of benefits regarding emotional expression, strengthening social connection, improving creativity, and stress reduction. The researcher has contacted the participants’ mothers to indicate the notable changes, and she embraces the positive changes compared to their siblings who live in different households. Showcasing that girls who engage in this experience improved mental status, sustained attention, and enhanced communication. In addition to adding a new routine with parental supervision to understand their children's psychological patterns and aim to improve them with current gadgets.

Chapter 4 – Final Reflection: Synthesis, Limitations, and Forward Directions

4.1 Conclusion:

Virtual reality (VR) is an emerging technology increasingly integrated into daily life as a tool for task performance. Beyond its application in gaming, VR has been adopted in various fields. Compared to other non-medical therapies such as painting, sketching, or coloring with tangible tools, VR reaffirms itself as a transformation tool for psychotherapy. VR provides a uniquely interactive experience, allowing users to externalize emotions in visual form. Non-medical therapies promote mental well-being, emphasizing self-expression and emotional regulation through personalized preferences. Traditional art features sensory enjoyment and physical product permanence. It also offers strong value in promoting patience, focus, and fostering motor skills.

However, VR presents the ability to cross the boundaries in terms of experiencing unrealistic elements. VR space can stimulate a realistic environment personalized to individuals' imagination standards. Users can create and use tools that do not exist in the physical world, which can promote creative senses with the freedom to commit mistakes and bring forth a unique dimension of new possibilities. As such, VR holds the advantage of being a liberating and empowering technology that can show a sense of control, curiosity, and joy.

Deepening the understanding of how immersive technologies are shaping therapeutic practices. The journey of participants' growth from initial hesitation to confidence indicates the significance of digital art therapy. Adolescents use the space not only to create but to heal and grow. This process fosters emotional resilience and self-awareness for adolescents. The interaction demonstrates structured creativity within an immersive setting that supports therapeutic outcomes. Therefore, these findings present the need for a culturally responsive and adaptable framework that can align with the younger generation's complex emotional landscape.

This qualitative study examined the use of art therapy in a virtual reality setting to investigate the therapeutic benefits for improving adolescent mental health. Three participants were selected based on their experiences with nervousness, anxiety, stubbornness, loneliness, and social isolation, all of which affected their psychological well-being. VR art therapy sessions were designed based on *The Principles of Art Therapy in Virtual Reality* by Hacmun, Regev, and Salomon. (2018). Following the sessions, semi-structured interviews were

conducted with the participants to determine the psychological changes. The results were divided into 6 sub-themes, indicating that the intervention effectively supported emotional expression, strengthened self-confidence, improved social connections, encouraged creativity and goal setting, and reduced stress and anxiety, even in the absence of direct therapist involvement. The virtual environment provided a space for unrestricted self-expression and a means of temporarily escaping real-life stressors, allowing them to take mental breaks and raise digital literacy.

4.2 Study Limitations:

Building on previous research (Jinkyung Kim & Yeo Ju Chung, 2024; Shamri Zeevi, 2021), this study demonstrates the effectiveness of VR therapy for adolescents. However, further research is needed to evaluate long-term effects with proper notice of the subject's factors such as age, gender, and health status. The VR headset used in this study was the PSVR, in combination with the PlayStation 4 console. Such a device is old, and more advanced versions have been released later that have improved features, especially in the art section. Due to the higher cost of newer models, the researcher was unable to access them for this study. It is important to note that the VR headset may cause dizziness and fatigue, and, in some cases, it can be intense. The participants reported similar experiences when asked about the negative aspects of VR use: "dizziness and fatigue associated with prolonged use."

4.3 Recommendations:

This research is dedicated to improving the implementation of technology integration into therapy. This study recommends that institutions, therapists, and professionals engage VR techniques in their practices and evaluate the outcomes. Future research should explore various VR applications as an art therapy medium and understand underexplored environments and tools for diverse populations. It is also important to consider the importance of training in helping practitioners feel confident and competent in using and explaining VR tools to clients.

However, accessibility remains a significant concern, and efforts should be made to ensure equal access to VR therapy regardless of their background. As a recent technological advancement, VR equipment is often considered costly for daily use.

To make VR experiences accessible to all society groups, a focus is needed on personalization to enhance engagement and ensure therapeutic progress relevant to the

subject's challenges. Therefore, each medical condition needs separate research combining qualitative and quantitative methods to comprehensively assess VR's therapeutic potential. This approach should include measuring the impact with continued mentoring to assist researchers in making necessary adjustments in the future.

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Appendix:

Interview questions:

- 1) What is your name? Age? Year of study? What are your hobbies?
- 2) What do you like to do in your leisure time?
- 3) How do you describe yourself among others at your age?
- 4) How do you envision engaging in this experience?
- 5) Which is more convenient to you and why: practicing traditional art or digital art?
- 6) What challenges do you encounter while expressing yourself in the virtual world?
- 7) What are the most common feelings that are evoked during engagement, and with what elements exactly?
- 8) Describe your feelings during the VR art session.
- 9) Describe your feelings after completing the experience.
- 10) What changes, if any, have you noticed in your attitudes or behaviors as a result of the experience?
- 11) What positive and negative aspects do you personally believe are associated with your experience?
- 12) If you were asked to engage in the VR drawing experience again, would you agree?

Transcript:

- **Najwan:**

1) What is your name? Age? Year of study? What are your hobbies?

“Najwan, I am 13 years old and in the 7th grade. Dancing, drawing, and swimming.”

2) What do you like to do in your leisure time?

“Watching YouTube, reading fiction, and dancing.”

3) How would you describe yourself among others your age?

“Generally, I would describe myself as an introverted person who doesn’t like to be engaged in social circles. Especially in school. I don’t find myself fit in most of the time.”

4) How do you envision engaging in this experience?

“I enjoyed this experience. I think it’ll be a cool way to try something different and express myself in a fun and creative way. I wasn’t expecting that VR has potential besides video games. Personally, I felt like it made drawing more interesting and interactive.”

5) Which is more convenient for you and why: practicing traditional art or digital art?

“Although I enjoy VR art, I prefer traditional art due to the ability to use a variety of tools and try different types of art. The VR world provides ease to draw and undo mistakes, which are lacking in traditional art, but it still has the danger of losing the art piece because of technical errors.”

6) What challenges do you encounter while expressing yourself in the virtual world?

“Sometimes it’s hard to get the tools in VR to do exactly what I want, like making small details or getting the colors right. Also, it felt a bit weird at first compared to drawing on paper, but I got used to it after a while. As well as sometimes the hand controllers lag, making the drawing either disappear or enlarge uncomfortably.”

7) What are the most common feelings that are evoked during engagement, and with what elements exactly?

“Nothing In particular, but mostly curiosity as I always wonder how I am going to create something impressive.”

8) Describe your feelings during the VR art session.

“During the VR art session, I felt focused and excited. It was fun to see my ideas come to life in 3D, and I liked experimenting with the tools. At first, I was a bit nervous about messing up, but as I got into it, I started feeling more confident and creative.”

9) Describe your feelings after completing the experience.

“After completing the experience, I felt proud of what I created. It was satisfying to see my ideas turn into something cool in VR. I also felt relaxed, like I had let out a lot of my thoughts and feelings through the art.”

10) What changes, if any, have you noticed in your attitudes or behaviors as a result of the experience?

“I felt the innovative ideas were flowing. In each session, I was excited to know what today’s theme was. Now I have many creative ideas that I want to convey somehow. Trying new technology made my creativity like never before. I am also happy that there is a new medium to practice art. I feel I now have my own space to express myself.”

11) What positive and negative aspects do you personally believe are associated with your experience?

“The VR space has given me a separate world of creative creation, enabling me to convert 2d pieces into 3d without restriction, besides making me feel relieved and happy. However, sometimes I feel dizziness and fatigue from overusing it, and I won’t feel the tangible arts in front of me.”

12) If you were asked to engage in the VR drawing experience again, would you agree?

“Sure! I would love to engage in a similar experience.”

- **Nouran:**

1) What is your name? Age? Year of study? What are your hobbies?

“My name is Nouran. I’m 12 years old and in 6th grade. My hobbies are drawing, playing video games, and dancing.”

2) What do you like to do in your leisure time?

“I like drawing characters, writing stories, playing games, and watching Korean TV shows.”

3) How would you describe yourself among others your age?

“I think I’m a bit louder than most kids, but I’m creative when it comes to innovation and like helping others when they need me.”

4) How do you envision engaging in this experience?

“I think it’ll be fun to try something new, especially using VR, because it’s exciting and different from regular art.”

5) Which is more convenient to you and why: practicing traditional art or digital art?

“I like both, but digital art feels easier because I can undo mistakes, and there are so many cool tools to use, while with traditional art, I can keep my art with me as physical elements.”

6) What challenges do you encounter while expressing yourself in the virtual world?

“Sometimes, it’s hard to draw exactly what I imagine because the tools feel different from using a pencil or brush. The infinite possibilities bring new ideas to each flow I draw.”

7) What are the most common feelings that are evoked during engagement, and with what elements exactly?

“I feel excited and happy, especially when using colors or drawing something big like a tree or house. It’s fun to see it come to life in VR making. “

8) Describe your feelings during the VR art session.

“It was a mix of being curious and amazed. I felt isolated in a separate world and forgot about everything else while I was drawing. The realm was empty, giving me a desire to create a whole new world that fits my standards.”

9) Describe your feelings after completing the experience.

“I felt proud of what I made and also relaxed like I let out a lot of my thoughts through the drawing.”

10) What changes, if any, have you noticed in your attitudes or behaviors as a result of the experience?

“I feel more confident sharing my ideas, and I’m less scared to try new things now. I’ve also gotten better at concentrating. Release the tension when it comes to realizing that learning tool makes me frustrated.”

11) What positive and negative aspects do you personally believe are associated with your experience?

“The positive part was that I got to be super creative and try something I never did before. The only negative part was that it was a little hard to get used to the controls at first and the dizziness sometimes.”

12) If you were asked to engage in the VR drawing experience again, would you agree?

“Yes, definitely! It’s really fun, and I want to make more cool stuff in VR.”

- **Haneen:**

- 1) What is your name? Age? Year of study? What are your hobbies?
“Haneen, 10, 6th grade at elementary school. Dancing, singing, drawing.”
- 2) What do you like to do in your leisure time?
“Drawing most of the time. dancing.”
- 3) How would you describe yourself among others your age?
“I don’t know how to describe it but maybe I always feel I am special in terms of passion, hobbies, and social role. I don’t like to engage with new people usually but I do love new acquaintances through my friends.”
- 4) How do you envision engaging in this experience?
“I feel like I’ve tried something new, and I am not expecting much of it. but overall, I enjoyed it.”
- 5) Which is more convenient to you and why: practicing traditional art or digital art?
“I like traditional art in terms of tangible elements while digital art is preferable because it's easy to use and free to commit mistakes. I love to try new tools that are not available in reality, making the world have infinite possibilities.”
- 6) What challenges do you face while expressing yourself in the virtual world?
“I sometimes find it hard to show my feelings in drawings because I don’t know if people will understand what I mean. Also, using the VR tools was tricky at first, like figuring out how to make things look the way I imagined.”
- 7) What are the most common feelings that are evoked during engagement, and with what elements exactly?
“Nothing in particular, but sometimes I can’t shape a certain image in my mind.”
- 8) Describe your experience during the VR art session.
“It was a unique experience; I had a lot of fun, and I felt my skills grow better.”
- 9) Describe your feelings after completing the experience.
“I feel excited, feel more open, energized, and like to share.”
- 10) What changes, if any, have you noticed in your attitudes or behaviors as a result of the experience?
“I feel like I have something new to add to my routine, as well as feeling excited to try something new in the VR realm. Noting that my art passion acquired a new aspect. I want

now to master the VR art applications. I also love to share my art and compare it with my sister's. I also wanted to teach my siblings to it and compete together.”

11) What positive and negative aspects do you personally believe are associated with your experience?

“Positive aspects that engaging in new technology regarding art and using it outside of gaming, feeling relief, and Having fun. While negative aspects were the dizziness and fatigue associated with the long use of the VR headset and the limitation of session time that hindered me from improving my art. “

12) If you were asked to engage in the VR drawing experience again, would you agree?

“Absolutely! I would love to repeat it.”