Jurnal ASPIKOM, Vol. 5, No. 2, July 2020, pp. 232-244
P-ISSN: 2087-0442, E-ISSN: 2548-8309
DOI: http://dx.doi.org/10.24329/aspikom.v5i2.709

Immersion and Presence in Virtual Reality to Alleviate Anxiety Disorder

Pencelupan dan Kehadiran dalam Virtual Reality untuk Mengurangi Gangguan Kecemasan

Erni Nurmalasari[1]
[1]Post Graduate Program of Communication Science Department, Faculty of Social and Political Sciences Universitas Indonesia, Jl. Salemba Raya No.4, Jakarta Pusat 10430
*Corresponding author, e-mail: nurmalasari.erni@gmail.com

Abstract

Mediated communication has become essential as the current development of technology advances. Virtual reality as an audiovisual technology with the ability to simulate a virtual environment similar to the environment in the real world plays a vital role in mediating communication. On the other hand, nowadays, issues about mental health, especially anxiety disorder, spread vastly and become a public concern. This paper aims to see how virtual reality as a medium of communication can reduce anxiety disorders by creating ambient co-presence. The method used was meta-synthesis with a meta-aggregation approach to get comprehensive results. The research found that two main factors exist in virtual reality, namely immersion and presence, which are important factors in mediated communication. These two factors can create ambient co-presence, so they can be applied to reduce mental illness, namely anxiety disorder.
Keywords*: Anxiety disorder; immersion; mediated communication; presence; virtual reality*

Abstrak

Komunikasi termediasi menjadi penting untuk diperhatikan seiring dengan kemajuan teknologi pada saat ini. Teknologi VR sebagai salah satu teknologi audio visual dengan kemampuannya untuk membuat simulasi lingkungan virtual yang sama dengan lingkungan yang ada pada dunia nyata. Teknologi ini menjadi penting dalam perannya memediasi komunikasi. Sekarang ini banyak isu tentang kesehatan mental salah satunya gangguan kecemasan. Makalah ini bertujuan untuk melihat bagaimana teknologi VR sebagai salah satu medium komunikasi dapat mengurangi gangguan kecemasan dengan menciptakan ambient co-presence (keberadaan bersama). Metode yang digunakan melalui meta-sintesis dengan pendekatan meta-aggregation agar mendapatkan hasil yang komprehensif. Hasil yang didapatkan adalah adanya dua faktor utama yang ada dalam teknologi VR yaitu pencelupan dan kehadiran yang merupakan faktor penting dalam komunikasi yang termediasi. Dua faktor ini yang dapat membuat keberadaan bersama (ambient co-presence), sehingga dapat di aplikasikan untuk mengurangi penyakit mental yaitu gangguan kecemasan.
Kata Kunci*: Gangguan kecemasan; immersion; komunikasi termediasi; presence; virtual reality*

Article History: *Received March 26, 2020; Revised June 23, 2020; Accepted June 25, 2020*

Introduction

Technological advancement in audiovisual has become an inseparable and essential part of the current people's life. The synthesis between sound and picture components become one in audiovisual, making anyone feel what they watch on screen. The audience satisfaction and amazement of audiovisual began in the 19th century by the digital animation display, followed by the advent of CGI (computer-generated imagery), a computer graphic use in creating effects that revolutionize the animation-making process. After that, it is completed by the invention of 3D animation and rapid transformation in technology, upscaling the picture quality (Mihailova, 2013), and technological advancement produced by the computer, perfecting the efficiency rate of picture elements. As pictured by Sobchack (2000), the old popular belief of (digital) technology invariably urges that the people be amazed by the utopic vision provided by the aesthetic power of digital technology (Mihailova, 2013).

Animation on audiovisual has figured in creating hyperrealism. The situation demonstrates that the human seems to associate object in the animation with the real object (Mihailova, 2013). The objects which are deemed creating hyperrealism has become more diverse due to media convergence. In the convergence, the users and conventional media, such as movies, television, print media, amalgamate with telecommunication and information technology industry, not only in terms of information and technology but also economics and aesthetics (Pradsmadji & Irwansyah, 2020). One of the audiovisual technology is virtual reality (VR). It is a part of media convergence, which creates sensory stimulus in the forms of pictures and voices (Musalek & Vasek, 2019) and provides experiences in the artificial world. It integrates the real world, which is constructed as the physical world, to a set of tools called VR (Ludlow, 2015).

The concept of VR first appeared in 1968. VR is a means to stimulate reality to the user's sense (Musalek & Vasek, 2019). VR is defined as interactive simulation created by computer hardware and software to give virtual environment experience to the users, which resembles the feeling of object and event in the real world (Weiss et al., 2014). Similar to other audiovisual technology, VR is also identical with terms immersion and presence. These two terms point to the immersion of VR's users in the virtual world that makes them not able to differentiate reality and virtual reality (Donga et al., 2019).

The nature of resembling the reality of VR is often associated with the future of technology in fictional movies and series, but VR is also often identified as a supplement to video games experience (Ludlow, 2015). The user engagement in VR signifies the difference in the level of immersion and presence in the traditional game and VR's game (Lum et al., 2018). A virtual sphere with a high immersion of engagement calls for the roles of the designer in designing the virtual world environment (Welty & Setiawan, 2019). VR, which is highly related to computer technology because of the picture quality and 3D, contributes to the sensory efficacy that depends on computational speed (Hu et al., 2018). The rapid development of science and technology accelerate the perfection and popularity of VR, making the use of VR expand to various fields (Hu et al., 2018). The claim refers to how VR is diversely applied to military practice, healthcare, education, manufacture, entertainment (McGlynn et al., 2018), advertising, architecture, professional simulation (Hu et al., 2018) environmental navigation, like maps (Hu et al., 2018), and psychological research

(Diemer et al., 2015). Furthermore, in communication, VR can also facilitate the user to feel the presence of their, for example, families who live far from the users (Donga et al., 2019). It is worth mentioning that kind of presence is essential to pacify anxiety, which often haunts many individuals in the world. It impels VR to consistently develop technology in the field of rehabilitation towards people with disabilities and phobia to reduce their fear. Recently, VR can be used to allay anxiety disorder (Diemer et al., 2015; Ludlow, 2015), which severely affects the mental health of the patients.

Recently, mental health issues have been topical. Organizations and individuals, like influencers, share messages to make people mindful of their mental health. Many researchers have studied this topic comprehensively. A study found that, although the most vulnerable age-group to the mental health crisis is students aged 18 to 25 years old, all age-group is actually vulnerable to mental health disorder (Wiens et al., 2020). Addiction to the attention and affection of other people to sustain one's pride is prone to a severe mental health disorder. It makes sense since individuals with high emotional addiction tend to have unhealthy bounding and excessive needs to feel connected emotionally with other people, even though the connection is superficial (Erving & Thomas, 2018). A type of mental health disorder is an anxiety disorder. Feeling anxious at an average rate is preferable. It helps to alter a method that may be incorrect. However, if the anxiety level is high and can decrease one's capacity to think, plan, and execute an intricate work, it calls for a unique treatment (Andrews et al., 2018).

Fear and anxiety felt by the patient are relatively peculiar in different situations. It makes anxiety disorder is partitioned into several characteristics to apply adequate treatment and cure to the sufferer. The characteristics start when the person suffers from excessive anxiety in the level of mind and behavior. The first is panic disorder. It happens when fear or anxiety attacks suddenly. Although this is merely temporary, in the critical state, the sufferer can feel that their lives are either useless or dead. The worries of the attacks are repeatable, and, therefore, the treatment is to try to avoid the triggering situation to emerge (Andrews et al., 2018). The second is social anxiety disorder (SAD). It is pointed out with fear and avoiding the situation in which the sufferer thinks that he is the center of attention, and other people see them as embarrassing (Andrews et al., 2018). The last is generalized anxiety disorder (GAD). It refers to excessive worry of commonplace things, avoiding or searching for certainty in an uncertain situation, too anxious of fallible thing and event creating worry. It also refers to difficulty in concentrating, easily irritated, sleep disorder, and excessive muscle rigidity (Andrews et al., 2018; Boschen, 2011). It is essential, therefore, to prevent the mentioned mental disorders.

Current development seemingly demanding us to invent fast before discharged by the competition becomes one of the factors people will suffer from the disorder mentioned. The design of VR, therefore, is expected to be therapeutic to the sufferers of anxiety disorder and new hope to solve the public concern. With this in mind, the efficacy of communication conveyed through VR for anxiety disorder sufferers should be taken into account.

Communication in the virtual sphere typically faces difficulty since interpersonal concept, or face to face meeting in the same environment is challenging to be realized in the situation (Benedictus, 2010). However, with VR technology, it can be resolved by creating an environment resembling the real world reality with the help of computer technology, which is capable of making a 3D virtual sphere and combining it with the real environment. It can only result from interactive computers. Avatar can also

be added to improve the presence of each individual (O'Connor, 2019). As other communication in other media, VR is communication mediated by computer devices. Mediated communication has altered the behavior of social relations and enhanced emotional and affective quality of how we interact. Devices have been more communicative to us when mediating communication with other people (Cefai & Couldry, 2019).

Many experts opine that all communication is mediated. For example, Asif Agha contended that "mediation" is the central concept in which social life has a character that is mediated. Everyone connected through utterances and other signs that can be recognized in the communication activity (Lundby, 2014). The mediation process that occurs regularly in communication depends on other mediation, in which media always comment, reproduce, and replace each other. It clings to all communication mediated (Lundby, 2014). On the other hand, this mediation development becomes mediatization in which catching long-term social and cultural transformation is mediated continuously (Lundby, 2014). Mediated communication is transformed to be mediatization process when mediation that is happening forms long-term transformation in the social, cultural, and political environment (Lundby, 2014). Mediatization in mediated communication merely sees the contemporary process of significant transformation (Lundby, 2014). This article, therefore, will examine how VR technology plays a role in the consultation practice process of psychologists and therapists, or closely related persons of the sufferers of anxiety disorder.

Presence in communication is vital. This is because, in each communication, the physical co-presence enable message exchange (Lundby, 2014). In mediated communication, technology involved can be different, but all of it creates 'presence' and provide space and time for users that are far from communication range (Lundby, 2014). In mediated face-to-face communication, there are two elements, namely scopic media and synthetic situations (Lundby, 2014). Scopic media is a type of mediation that involves screen-based electronic media designed to catch a specific mediation that is experienced (Lundby, 2014). On the other hand, the concept of synthetic situation responds to a phenomenon that this type of mediatization reaches the most basic element of human interaction, namely social situations (Lundby, 2014). Screen-based synthetic social situations alter the face-to-face situation. Consequently, the domain of face-to-face interaction does not have architectural interest anymore, which previously was possessed by the traditional social situation (Lundby, 2014). This mediated communication, when experiencing the presence of other people and immersion, fuse the users with the screen entirely, and communication happens in which information or message exchange (Lundby, 2014). It suggests that an essential concept in mediated face-to-face communication is presence and immersion in the technology used.

Presence is the fundamental concept of VR and other mediated communication by computer devices. It is also usually called mediated co-presence, meaning co-presence that is mediated by an interaction that is done by altering physical co-presence (physical co-presence in direct communication). However, there is another development of mediated co-presence, namely ambient co-presence. What makes ambient co-presence differ is that deeper consciousness of the other presence, which is far, can be felt. It is possible with the help of technology convergence reached by social media and other devices (Madianou, 2016). Ambient co-presence makes a warm feeling of the presence of closely related persons as if they are together with the users in the virtual sphere. It creates nearness, although it is only imaginary of nearness. However, it can allay the

feeling of absence out of distance (Acedera & Yeoh, 2019). Immersion and presence, therefore, are essential in mediated communication, so too in relieving anxiety disorder. VR can be used to communicate with the sufferers. VR should understand how to develop the rate of immersion and presence received by the sufferer so that it can be adequate and match the needs of the sufferers.

Explanation of VR technology above, as well as with anxiety disorder and mediated communication, show the relation to analyze the function of current technology in reducing mental health disorders which now become a public concern in almost social media platforms. In light of that, the research questions how the function VR technology as a process replaces physical co-presence in face-to-face communication by introducing ambient co-presence, and how ambient co-presence can reduce anxiety disorder. This article then aims to explain how VR technology can reduce anxiety disorder by presenting ambient co-presence in the process of creating nearness.

Method

The research applied a meta-synthetic method. A meta-synthetic analysis is a systematic approach to enhance the interpretation level of the primary qualitative studies (Caesar Vundule, Fidelia Maforah, Rachel Jewkes, 2017). Meta-synthetic analysis functions as a means to interpret and combine qualitative findings in all studies conducted by individuals. The result of meta-synthesis is more than an extended summary of the previous findings. Meta-synthetic in qualitative research is not intended to 'sum' all data available, but to present a new perspective of a topic through an interpretation from various qualitative studies (Caesar Vundule, Fidelia Maforah, Rachel Jewkes, 2017).

In this conceptual research, meta-synthetic is opted to elaborate on the functions of VR technology and categorize it to be specific themes. It is expected with the synthetic that an analytical framework may emerge. The themes mentioned are obtained through examining and comparing relevant studies before summing it up to effect a new understanding of concepts. Steps in performing meta-synthetic analysis are as follows: the first is formulating the research questions. Another step is examining qualitative studies focusing on the issue that will be expanded by the researchers. The next step is filtering studies relevant to topics. The fourth step is evaluating, and the fifth step is analyzing the relationship among studies. The last step is synthesizing and express the result of synthesis (Caesar Vundule, Fidelia Maforah, Rachel Jewkes, 2017).

This research, with meta-synthetic analysis, aims to acquire a complete picture of the function of VR technology as an ambient co-presence process to reduce anxiety disorder and present a new perspective of the topic through an interpretation of different qualitative studies. The following are steps used in the research:

1. Formulating research questions
   The research focused on analyzing how VR technology can reduce anxiety disorder. Some relevant questions can be asked to obtain answers from the qualitative study:
   a. The first question: What fields are VR technology used in?
   b. The second question: How can VR technology create ambient co-presence?
   c. The third question: How can ambient co-presence reduce anxiety disorder?
2. Conducting a literature review

The Source of the literature review in the research was retrieved from SAGE (https://www.journals.sagepub.com) and DOAJ (https://doaj.org). The searching used keywords or their accurate synonym to help the researcher to find the most representative literature.

3. Filtering literature obtained
   In filtering, the researchers checked the most relevant titles to the study developed.
4. Evaluating the literature
   In this step, the researchers read the abstract of each literature to find concepts that will be developed. The researchers also grouped studies that were similar and connected. The grouping results are as follows:
   a. Which literature that explains concepts, benefits, and other related factors that are relevant to VR technology and its use in rehabilitating mental illness or disorder concurrently.
   b. Which literature that only focused on the presence factor of VR.
   c. Which literature that only focused on the immersion of VR.
   d. Which literature that only focused on mediated communication.
   e. Which literature that only focused on mediated co-presence and ambient co-presence.
   f. Which literature that only focus on anxiety disorder
5. Analyzing the relationship among studies
   In this step, when the researchers have found and grouped the literature review results, the researcher related the related concepts before synthesized.
6. Developing reciprocity
   After finding the relationship among studies, the concepts were developed to find a new perspective.
7. Synthesizing and expressing the literature review
   In this stage, after relating and developing the reciprocity of the studies, which were primary sources in the research, the researchers synthesized the result and made it into a coherent article.

Results and Discussion

VR Technology as Media in Communication

Computer technology that is increasingly developing makes VR also developed in various fields, ranging from education, health, psychology, and rehabilitation. Principally, the level of immersion and presence in the VR and other technology media are different (Lum et al., 2018). The critical factor of VR is the deep level of immersion and presence in the virtual sphere. The presence itself can be partitioned into two definitions. The first is descriptive that only focuses on the description of the presence's component, and the second is structural that aims to analyze how the experience of presence produced in mind (Diemer et al., 2015). Research by Diemer on the effect of perception and presence resulting from VR technology analyzed the reaction of the users' emotions (Diemer et al., 2015). In the research mentioned, there are two concepts to build emotion, namely sign perception and conceptual information. Diemer's research was given to people with a phobia of animals, which in this case was something like spiders, and with social anxiety. Sign perception here is given with a real picture of the fear, while conceptual information which is given is mere information of the fear (Diemer et al., 2015). The experiments found that VR can strengthen the emotion of

fear.

Diemer's research is in line with studies on how VR is used to heal phobia towards animals like spiders (Musalek & Vasek, 2019). In the research, presence and immersion were used to activate the emotion of the sufferers. As a result, when the sufferers visit VR's environment, they produced a feeling that cannot differentiate between the virtual and real worlds. In the virtual world, the sufferers will try to face their phobia. The result is that the sufferer can reduce the phobia of animals by taking advantage of immersion and presence. It is also worth mentioning to understand the self-consciousness mood during visiting the virtual world (Xia & Hwang, 2019). In this context, the essential factor is that presence is considered as the physical experience of the physical or virtual. Rather than differentiating the physical or virtual, presence refers to the perception of the environment through a mental process. This fact challenges the transmitter of information within VR since they need to consider how the users experience the same perception experience. Interactivity is essential here, especially on how the user of the VR system can affect shapes or content in the virtual environment. The designer of the virtual environment should know how the users perceive the virtual world to provide the most representative response.

As mentioned before, immersion and presence is an essential factor in audiovisual technology and mediated communication, and another research demonstrated that VR in education (Ludlow, 2015) also involves immersion and presence as the primary indicator of the success of the implementation of VR in education. Indeed, the research mentioned argues that VR technology is suitable for the rehabilitation and therapy of children with disabilities. This result is consistent with the previous research on VR that showed that VR could be used for children with brain paralysis (Weiss et al., 2014). In this case, VR figures in creating a chance of motoric practice or active sensory to improve their potential in learning. Interactive simulation in this virtual sphere also involves immersion and presence so that people with a neurological problem can actively participate in the virtual world.

Presence and immersion in this context are also discussed in the Donga's research on how people can feel the presence of others in the VR's virtual environment (Donga et al., 2019). Donga mentioned the importance of immersion and presence in the VR's environment. In that research, immersion is identified as an objective level of sensory loyalty on what is presented by VR's system (Donga et al., 2019). It can mean that the immersion level of oneself in VR impose that user not to differentiate the virtual and real world. The presence level determines the immersion level. The former is defined as the psychological and subjective response of the users toward VR's system (Donga et al., 2019). It indicates that the more effective the response in the VR, the deeper the immersion level in the VR. That is, with immersion and presence, there occur imaginary of nearness (Acedera & Yeoh, 2019). Associating this with the ambient co-presence concept, it says that nearness of the presence of other people who live far from the users' place is enabled by the media convergence to raise awareness of the problem (Madianou, 2016).

VR technology has the potential application to promote the emotional welfare of the physical, cognitive, and social for their users in any age-group (McGlynn et al., 2018). The individual capability of developing and sensing the physical co-presence in the virtual world is called spatial presence. It is a subjective experience in which the self thinks he is in a specific location. In many cases, the action felt may relate to the mediated spatial environment and mental capacity that is tied within it. When the self

has not been able to differentiate the virtual and real-world because of individual interaction that is obtained from the presence, this situation can be categorized as ambient co-presence. Creating ambient co-presence in VR calls for designs that are capable of stimulating psychological response, namely presence and loyalty, on sensory in seeing the object in the VR. With that, immersion can be realized completely. It is in line with research on how a revolution in design to establish a virtual sphere triggers the deep involvement of the users (Welty & Setiawan, 2019). The design used to enhance a higher level of immersion is by activating a feedback loop process so that when interaction in the virtual sphere happens, it does improve not only the immersion level but also presence. Eventually, it can enable ambient co-presence.

Ambient co-presence can be created from mediated communication due to processes that alter the physical co-presence to be mediated co-presence (Lundby, 2014). Communication patterns that happen through VR technology involve deep immersion level by creating a virtual sphere that can barely be distinguished from the physical sphere as a traditional place for face-to-face communication. A deep immersion level corresponding with a high level of presence can engender ambient co-presence.

As mentioned before, with a high level of immersion and presence, VR technology can be used as an application that assists people in meditating and relaxing. This function is considered useful for managing stress and anxiety. For example, in a study, VR can help cancer patients to relieve their depression symptoms (O'Connor, 2019). Clinical test on VR is also borne out to pain management, eating disorder, and other rehabilitation. VR technology can reduce mental health disorders for people who suffer from anxiety disorders.

Mediated Communication of VR and Reduction of Anxiety

As mentioned earlier, principally, VR is an application that involves sensory and motoric experience when the user has entered the virtual world presented by virtual reality. How can this system be applied to reduce anxiety disorder? Mental illness is quite prevalent in today's world, and the worst is that this illness can harm one's health, daily life, welfare, and cognitive process, such as care and emotion management (Panteleeva et al., 2017). It is aggravated with a stigma from local society regarding this mental illness. Many people assumed that this problem is embarrassing, deemed as a sin, making people who are suffered discriminated, rejected, and dwarfed in their community (Beyond Blue, 2014). As long as this stigma is still nurtured, the sufferers would still be affected because perceptions that other people will be looking at the sufferers negatively can discount their confidence to look for solutions and support from psychological practitioners and closely related people.

When technological advancement appears, it should contribute to ameliorate the issue. As stated by O'Connor (2019), VR can pacify fear and anxiety. Family and close friends play a significant role in giving practical and emotional support to the sufferers or at least listening to their complaints regarding their issue (Beyond Blue, 2014). What is important here is if people that suffer from anxiety disorder desperately needs help to reduce their anxiety and worry level. However, the people who can help often cannot stay 24-hour straight with them. VR, therefore, in moderation, can fill this hole. VR can be used to accompany the sufferers in reducing the level of their anxiety disorder. VR technology, as mediatization of communication, is a screen-based face-to-face technology that has two essential concepts, namely scopic media and synthetic

situations.

Scopic media in VR technology play a significant role in mediated communication. Firstly, VR technology can present and project events, phenomenon, and actors which are separated by space and cannot be seen from the first-person point of view. Secondly, VR technology can adjust the time difference by presenting content sequentially with the streaming feature. Thirdly, VR technology creates reality to make the world so that the users can visit it as they wish. Fourthly, VR technology also enables extension through algorithms to take over and fulfill the human function. Fifthly, VR technology can change face-to-face situations to synthetic situations, in which physical co-presence does not determine anything. What is relevant is how media and electronic screens configure the situation to the virtual sphere in VR.

On the other hand, a synthetic situation in communication is mediated by VR technology. In that situation, the other humans or actors are not required to present physically. They only present as a response. VR technology as a synthetic situation does not need physical presence; they are only responsible for responding without delay that is not suitable with interaction or interaction demands. The synthetic situation, as an environment added with components, can find the users in the same ambient co-presence without physical co-presence (Lundby, 2014).

Ambient co-presence is a situation where VR technology is applied by taking advantage of the level of immersion and presence so that the users can feel the co-presence of other people through the virtual world, making the feeling of nearness. It is deemed productive for people with anxiety disorders to keep them pacified. This is because the sufferers can feel the nearness created by VR. The presence of closely related people to support them is essential, considering that the people with mental illness often only need to be listened to and responsibly responded. It is the situation produced by VR, replacing the role of the others' presence in the physical world.

In the psychological world, VR technology has been applied as exposure therapy called virtual reality exposure (VRE). The therapy aims to reduce anxiety by conditioning the people to face what they are afraid of (Beyond Blue, 2014). VR technology in mediated communication plays a part as a process that replaces counseling practice between the sufferers with the psychologist or therapists. In this vein, the use of VR technology has several advantages. Besides the fact that the patients will not receive direct exposure to real-world threats, making the patients convenient, it can also be conducted in a location that is deemed comfortable for the patients. It is predicted that with VR technology, the cost of therapy will decrease. Unfortunately, VRE only works for some types of phobia, such as social anxiety disorder, and panic disorder. This therapy has not been borne out to deal with a generalized anxiety disorder (GAD) (Beyond Blue, 2014). GAD does need not only virtual world therapy but also real-world medications.

Each person that has this disorder has a different way of treatment. It is relative to their condition, situation, needs, and preferences. Besides supports from closely related people, the sufferers are recommended that they have psychological treatment by consulting to psychologists, therapists, or other health-related workers. When the level of mental health is deemed not too severe, e-consultation is preferable. However, e-consultation may face some difficulties if the patients do not actively interact with and follow the therapist's recommendation. In light of that, VR that emphasizes the aspects of immersion and presence is considered adequate to alter the method of e-consultation in involving the patients with the material given.

Social distancing and VR technology for People with Anxiety Disorder

Social distancing conducted by Indonesia and the world to stop the spread of Covid-19 as a global pandemic in 2020 at some point seems to normalize panic, anxiety, and fear. The question is, how about people who already suffer from anxiety disorders? Does it exacerbate the symptom? Clearly, people with this illness may experience profound anxiety. Mediated communication, therefore, is necessary today for people with mental disorders. When all citizens are urged that they should socially distance, only technology can bring the people together. The question is how technology can make ambient co-presence available for all, primarily those who have anxiety disorders? It would be challenging for them to manage their anxiety level when everyone also experiences a certain level of anxiety out of the pandemic. Therefore, when VR technology has been adequate for managing depression, fear, and anxiety level, it would be more comfortable for the people with anxiety disorders to get treatment from psychologists through virtual world as the message transmitter medium, especially if the people cannot have direct communication with the psychologists or therapists. A synthetic situation created by VR technology with its added components is capable of making ambient co-presence without a physical presence, although a responsible response is still needed; and that interaction in the virtual world makes a high level of presence and immersion. As a result, advancement in technology, which creates ambient co-presence, can help people to reduce their anxiety disorder level.

Conclusion

Virtual reality is a technology that offers a sensory experience to the users. The current development transforms this technology to be more widely applied in many fields, ranging from education, healthcare, psychological research, to entertainment, such as games. Technology in virtual reality is the same as other audiovisual devices that emphasize a certain level of immersion and presence. That immersion and presence then become the indicator whether the users enter the virtual reality, by noticing whether they have been able to differentiate the virtual and world reality or not. Indeed, VR itself has been vastly employed for anxiety reduction therapy before a clinical operation is executed. Also, it can pacify fear of a particular phobia and anxiety disorder as a form of mental illness. Issues on mental health now are discussed by a wide range of people, ranging from organization, community, to individual. They participate in raising people's awareness of mental health. This is because many stigmas that flourish in society in treating people with this illness makes them not receive adequate support to rehabilitate themselves. Consequently, their anxiety level becomes worse.

Family and closely related persons play a significant role in supporting the recovery of the anxiety disorder sufferer. Not only do they call for moral and emotional support, but the sufferers also need presence support when they are complaining about their worry. Unfortunately, those people cannot be with them 24 hours continuously. In this vein, media convergence enables this relationship to happen. Media convergence can create a feeling of nearness from ambient co-presence during the use of technology that uses mediated communication. The synthetic situation in VR technology with a high level of immersion and presence can make the feeling of the presence of closely related persons or ambient co-presence deeper. VR, therefore, will help people who support the sufferer and practitioners like psychologists and therapists to perform more comfortably. In the case of therapists, many therapists have used a type of VR called virtual reality exposure (VRE). It is relatively significant to reduce the anxiety level of

the sufferers by giving them exposure to their source of anxiety. It is deemed efficacious to allay worriedness without harming the sufferers as direct exposure does. However, this therapy can only be done at an average rate of disturbance. At a high rate of disturbance, an accompaniment of health workers is needed. VR technology will be developed with a higher level of immersion and presence. They will strive for a more in-depth experience of involvement, including for therapeutic purposes, in virtual reality, and ambient co-presence of each user. In that improvement, the technology will not only be preferable for therapy but also for connecting families that are being separated from each other so that they can share the feeling of the same environment.

This conceptual article only discusses the process of how VR technology in mediated communication plays a role in reducing anxiety disorder. However, the aftereffect of VR technology after implemented to the sufferers has not been taken into consideration. The next research on that topic is essential for the development of VR that supports mediatization in communication and, in a long-haul, transform social, cultural, or political environment structurally, and can accommodate any communication forms conducted through media of technology.

Acknowledgements

The author is grateful for the editor, for early discussions about and consideration of this manuscript. Thanks to the tremendous reviewers whose critical and thoughtful comments further developed this article.

References

Acedera, K. A., & Yeoh, B. S. A. (2019). 'Making time': Long-distance marriages and the temporalities of the transnational family. *Current Sociology, 67*(2), 250–272. https://doi.org/10.1177/0011392118792927

Andrews, G., Bell, C., Boyce, P., Gale, C., Lampe, L., Marwat, O., Rapee, R., & Wilkins, G. (2018). Royal Australian and New Zealand College of Psychiatrists clinical practice guidelines for the treatment of panic disorder, social anxiety disorder and generalised anxiety disorder. *Australian and New Zealand Journal of Psychiatry, 52*(12), 1109–1172. https://doi.org/10.1177/0004867418799453

Benedictus, A. (2010). Konstruksi diri dan pengelolaan kesan pada ruang riil dan ruang virtual. *Jurnal ASPIKOM, 1*(1), 26–40.

Beyond Blue. (2014). *A Guide to What Works for Anxiety*. 1–131. http://resources.beyondblue.org.au

Boschen, M. J. (2011). Generalized Anxiety Disorder in Adults: Focus on Pregabalin. Clinical Medicine Insights: *Psychiatry, 3*, CMPsy.S5069. https://doi.org/10.4137/cmpsy.s5069

Caesar Vundule, Fidelia Maforah, Rachel Jewkes, E. J. (2017). *LSHTM Research Online. 61*, 61–67.

Cefai, S., & Couldry, N. (2019). Mediating the presence of others: Reconceptualising co-presence as mediated intimacy. *European Journal of Cultural Studies, 22*(3), 291–308. https://doi.org/10.1177/1367549417743040

Diemer, J., Alpers, G. W., Peperkorn, H. M., Shiban, Y., & Mühlberger, A. (2015). The impact of perception and presence on emotional reactions: A review of research in virtual reality. *Frontiers in Psychology, 6*(JAN), 1–9. https://doi.org/10.3389/fpsyg.2015.00026

Donga, Marques, Pereira, & Gomes. (2019). The Sense of Presence through the

Humanization Created by Virtual Environments. *Proceedings, 21*(1), 7. https://doi.org/10.3390/proceedings2019021007

Erving, C. L., & Thomas, C. S. (2018). Race, Emotional Reliance, and Mental Health. *Society and Mental Health, 8*(1), 69–83. https://doi.org/10.1177/2156869317713552

Hu, N. T., Tsai, P. S., Wu, T. F., Chen, J. Y., & Lee, L. (2018). The environmental navigation using geometric virtual reality. *Advances in Mechanical Engineering, 10*(6), 1–13. https://doi.org/10.1177/1687814018783636

Ludlow, B. L. (2015). Virtual Reality: Emerging Applications and Future Directions. *Rural Special Education Quarterly, 34*(3), 3–10. https://doi.org/10.1177/875687051503400302

Lum, H. C., Greatbatch, R., Waldfogle, G., & Benedict, J. (2018). How immersion, presence, emotion, & workload differ in virtual reality and traditional game mediums. *Proceedings of the Human Factors and Ergonomics Society, 3*, 1474–1478. https://doi.org/10.1177/1541931218621334

Lundby, K. (2014). *Mediatization Of Communication: Handbook of Communication Science (P. J. Schulz & P. Cobley (eds.))*. De Gruyter Mouton.

Madianou, M. (2016). "DOING FAMILY" AT A DISTANCE: Transnational Family Practices in Polymedia Environments. The Routledge *Companion to Digital Ethnography, 2*, 102–111.

McGlynn, S. A., Sundaresan, R. M., & Rogers, W. A. (2018). Investigating age-related differences in spatial presence in virtual reality. *Proceedings of the Human Factors and Ergonomics Society, 3*, 1782–1786. https://doi.org/10.1177/1541931218621404

Mihailova, M. (2013). The mastery machine: Digital animation and fantasies of control. *Animation, 8*(2), 131–148. https://doi.org/10.1177/1746847713485833

Musalek, M., & Vasek, L. (2019). Possibilities of using virtual reality as a means for therapy from fear of spiders. *MATEC Web of Conferences, 292*, 01041. https://doi.org/10.1051/matecconf/201929201041

O'Connor, S. (2019). Virtual Reality and Avatars in Health care. *Clinical Nursing Research, 28*(5), 523–528. https://doi.org/10.1177/1054773819845824

Panteleeva, Y., Ceschi, G., Glowinski, D., Courvoisier, D. S., & Grandjean, D. (2017). Music for anxiety? Meta-analysis of anxiety reduction in non-clinical samples. *Psychology of Music, 46*(4), 473–487. https://doi.org/10.1177/0305735617712424

Pradsmadji, S. I., & Irwansyah, I. (2020). Media Convergence in the Platform of Video-on-Demand: Opportunities, Challenges, and Audience Behaviour. *Jurnal ASPIKOM, 5*(1), 115. https://doi.org/10.24329/aspikom.v5i1.491

Weiss, P. L., Tirosh, E., & Fehlings, D. (2014). Role of virtual reality for cerebral palsy management. *Journal of Child Neurology, 29*(8), 1119–1124. https://doi.org/10.1177/0883073814533007

Welty, C., & Setiawan, A. (2019). Digital Immersion − case studies in virtual reality. *SHS Web of Conferences, 64*, 01007. https://doi.org/10.1051/shsconf/20196401007

Wiens, K., Bhattarai, A., Dores, A., Pedram, P., Williams, J. V. A., Bulloch, A. G. M., & Patten, S. B. (2020). Mental Health among Canadian Postsecondary Students: *A Mental Health Crisis? Canadian Journal of Psychiatry, 65*(1), 30–35. https://doi.org/10.1177/0706743719874178

Xia, Z., & Hwang, A. (2019). Self-position awareness-based presence and interaction in

virtual reality. Virtual Reality, 0123456789. https://doi.org/10.1007/s10055-019-00396-8