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Readiness and Usability of Virtual Reality Technologies in Mental Health: A Local Perspective

Abstract: - In the Philippines, there are several indicators that point to the readiness of Mental Health Professionals (MHPs) towards virtual reality (VR) technologies in the area of mental health management. Most MHPs already use technology in their practices, and many view VR with openness. Relaxation and exposure therapy were particularly seen to be as promising applications. However, there are challenges about the impact of VR's on the patient-therapist relationship, therapeutic goals, cost effectiveness, and accessibility issues. With the early implementation of VR technologies, little information about long-term VR therapy data, clear VR therapy guidelines, and data privacy regulations are available. The social influences within the mental health culture may also play a role in the adoption of VR technologies in mental health. It is found out that locally, MHPs seem receptive to VR technologies, but further research and addressing its challenges are necessary before VR becomes one of the major mental health intervention options in the Philippines.

Keywords: Interventions, mental health, virtual reality technology

I.   INTRODUCTION

Over the past years, there are a lot of promising technologies that offer services to better manage mental health problems. According to the Department of Health (DoH), at least 3.6 million Filipinos are dealing with mental health problems related to the pandemic, including alcohol use disorders, mood disorders such as bipolar disorder, and depression [1]. As highly interactive web-based technologies are being used among Filipinos; quickly shifting community perceptions of those seeking assistance for mental health issues can be addressed in the emergence of virtual reality (VR) technologies as crucial tools for assessing, evaluating, and treating medical and psychological illnesses. Virtual reality is the term used to describe three-dimensional, interactive, multisensory, immersive, and technologically complex computer-generated environments that are viewer-centered [2,3]. Virtual reality has been used to treat certain disorders such as depression alongside counseling and cognitive behavioral therapy. For the counselor to examine the client's behavior and response to it, a virtual reality simulation of a situation where depression behavior likely occurs is used. With the growing interest of virtual reality in mental health, it was aimed to determine the readiness of Filipinos in terms of using virtual reality as a tool for assessment and a technology that could produce the right kind of virtual reality-based therapy. While VR is gaining traction in mental health treatment globally, limited research has explored the readiness of mental health professionals in the Philippines to adopt this technology.

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II.   REVIEW OF RELATED LITERATURE

Mental health disorders are a significant challenge, and the COVID-19 pandemic has only made these pre-existing conditions worse. The demands of users are difficult to address, and many people who need care are not reached by mental health services. According to the World Health Organization (WHO), the largest source of illness burden globally by 2030 would be mental diseases [4]. Different mobile apps, advanced sensors, and other digital technologies have the potential to enhance the delivery of health services. By extending the reach of the current interventions and by leveraging cutting-edge technologies to track healthy behavior, these technologies are anticipated to improve patient outcomes. Real-time data collecting made possible by digital technology may lead to instant healthcare actions using virtual reality applications.

Virtual reality is a three-dimensional world that is created through computer graphics but has the appearance of being genuine, complete with scenes and objects that immerse the viewer in the environment [5]. With this capability, VR ensures a high level of immersion for the user. There were studies that investigated the use of VR-based therapy as a replacement for in-vivo and fictitious exposures or as an addition to a variety of therapeutic tools [6]. A study revealed that the usage of VR could quickly increase our understanding of paranoia. The assessment of symptoms, the establishment of symptoms correlations, the identification of predictive variables, the establishment of causal factors, the identification of differential predictors, and the identification of environmental predictors are only a few of the uses of virtual reality [7]. As patients are exposed to a more controlled environment than in traditional treatment, VR-based therapy has the advantages of shortening treatment sessions, personalizing treatment, and being cost-effective in terms of financial costs, logistics, and hazards [6]. However, this is on a case-to-case basis depending on the capacity of the patient to avail VR technology-based services.

Virtual reality can also be used to treat post-traumatic stress disorder (PTSD). The patient is exposed to triggering events, such as war, disasters, and other traumatic scenes inside the VR. The theory behind this type of therapy is that by exposing the patient to the cause of their ailment and teaching them how to relax, they will be able to adjust to the stress. Additionally, as they are exposed to this progressively, the threat level is reduced, which in turn lessens their fear. It is anticipated that the patient would eventually stop experiencing the anxiety brought by their disease [8].

Study findings are restricted to research labs and cannot be extrapolated until virtual reality is applied in a real therapeutic setting [9]. Hence, it is crucial to assess prospective users' familiarity with and preparedness to adopt virtual reality [10]. With this, research on the readiness of Filipinos on virtual reality is conducted to evaluate user's perceptions on using VR in mental health.

III.   METHODOLOGY

A procedure on how to identify the perceived virtual reality readiness of our mental health professionals was developed and shown in Figure 1. From the target respondents, quantitative data composed of performance expectancy (PE), effort expectancy (EE), facilitating conditions (FC), and social influence (SC) were obtained. Qualitative data were also obtained through an interview. Both quantitative and qualitative data were used in a mixed method approach to obtain the perceived readiness and usability of virtual reality technologies in mental health.
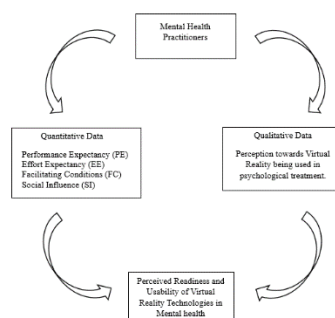

Fig. 1. Conceptual framework of the application

A. Research Design

The paper used Mixed methods that includes the use of both interview and survey questionnaires. Qualitative data are collected and analyzed to help explain perception and experience of the participants through interviews. Quantitative data is used to emphasize analysis with numerical data.

B. Respondents

The respondents for this study are mental health practitioners and professionals who are practicing in the Philippines.

C. Instrument

This study used a questionnaire composed of a set of randomly ordered 15 statements rated using a 5-point Likert scale ranging from "strongly agree" to "strongly disagree". The randomization was used to avoid potential bias (e.g., unconscious perception of the statements' sequence and were classified into four categories 'performance expectancy: an individual's belief that utilizing the system will enable him/her to improve work performance', 'effort expectancy: the ease with which a system may be used', 'facilitating conditions: an individual's belief that a system's organizational and technological infrastructure exists to enable its use', 'social influence: an individual's social group (e.g., colleagues) feels that employing new technologies or systems is consistent with group attitudes').

D. Data Gathering

The data were obtained online via a digital platform. Each participant answered the consent form agreeing on their voluntary participation in the study with the absence of any kind of coercion or intimidation.

E. Informed Consent Process

Informed consent forms were provided containing the limitations, risks, and benefits of participation in the study. It was approved through a third-party ethics review committee. Furthermore, all data and information gathered from the results and interpretation of instruments were treated with utmost confidentiality and were destroyed after a month of analysis and interpretation.

F. Statistical analysis

The statistical tool used for this study was frequency and percentage to identify the number of responses from the participants. Pearson r Correlation to identify the relationship between the age and virtual reality readiness; Point Biserial Correlation to identify the relationship between sex, age and virtual reality readiness; and Spearman rho Correlation to identify the relationship between educational attainment and virtual reality readiness.

IV. RESULTS AND DISCUSSION

The online survey was participated in by 12 mental health professionals. The number of female respondents is twice as many as the number of male respondents with 8 (66.67%) and 4 (33.33%), respectively. The mean age of the respondents is 33, with the youngest having an age of 27 years old, while the eldest is 44. Most of the respondents are single (10, 83.33%), while only two are married (16.67%). half of the respondents are graduates of master's degree (6, 50.00%). Meanwhile, five of them are graduates of bachelor's degrees and only one is a graduate of a doctorate degree. This distribution of respondents by educational attainment. Most of the mental health professionals are counselors (5), followed by psychologists (4) and some are instructors/faculty members. Other job positions include psychometrician/guidance associate, HR director, assessment coordinator, therapist, program chairperson, and social worker. Most of the respondents are less than 5 years in their current position with seven (58.33%) while four of them are 5-10 years in their current position (33.33%). Only one of them is already 10-15 in their current position (8.33%). two-thirds or eight of the respondents have less than 5 years in total working in the mental health field. There are two respondents each in the categories of 5-10 years and 10-15 years of experience in the mental health field. Most of the respondents are treating/have treated anxiety disorders/GAD with eight (28.57%), followed by depression/MDD with seven (25%). Three (10.71%) of the respondents treat personality disorder/BPD and similarly, three of them also treat trauma-related conditions. Some other conditions that the respondents treat include suicide and mood disorders with 2 responses each (7.14%) as

well as stress, self-esteem, and emotion regulation problems with one each (3.57%). Most of them have less than five (7) and only three of them have 5 or more patients per week. Most of the respondents (9, 75%) have already used any kind of technology as part of their patients' treatment.

Table 1 shows that the respondents commonly used technology for tele-consultations and therapy sessions (7, 63.64%), while some other purposes mentioned include communicating with student/online support (2, 18.18%), research and creating presentations (1, 9.09%).

Table 1. Purpose for the use of technology

Purpose of using technology	Counts	% of Total
Tele-consultation and therapy	7	63.64 %
Communicating with student, online support	2	18.18 %
I use it for research and creating presentations	1	9.09 %
Not applicable	1	9.09 %

For these purposes, eight out of the nine respondents who use technology in their treatment stated that their experiences with the technology is positive and they work well. However, some of them have also mentioned problems including security issues, inability to see nonverbal cues, and connectivity issues.

Table 2 shows the frequencies of the respondents' awareness about VR in mental health. MHPs have admitted to their awareness of the possible usage of VR in mental healthcare and various treatments while also admitting their limited understanding of how it works and being conceptualized considering their concerns about how it possibly provides a patient-therapist relationship and meets therapy goals [11]. Majority expressed their awareness about VR technology, but they lack the experience of using it and applying the technology in their practices. With the given awareness, this opens the gate for the actual introduction of this VR technology in mental health together with its concepts, techniques, and the strategies of how it can be a useful tool for mental health intervention.

Table 2. Frequencies of awareness about the use of VR in mental health interventions

Have you heard about the use of Virtual Reality (VR) in mental health therapy?	Counts	% of Total	Cumulative %
Yes, I am aware of VR for mental health treatment and have used it in my treatment. (A)	0	0.00 %	0.00 %
Yes, I am aware of VR for mental health treatment,	1	8.33 %	8.33 %

but I have not used it myself. (B)			
Yes, I understand the concept of VR for mental health treatment, but I do not know how it works. (C)	2	16.67 %	25.00 %
Yes, I have heard about the use of VR for mental health treatment, but I do not understand the concept or how it works. (D)	5	41.67 %	66.67 %
No, before completing this survey, I had not heard about this at all. (E)	4	33.33 %	100.00 %

Table 3 shows the perceived usage of VR technology as practiced by the respondents. The application of virtual reality in Relaxation gathered the most responses. Other treatments specified include in vivo exposure, imaginary exposure, relaxation includes (mindfulness meditation), present-centered therapy, and diagnosing mental disorders.

Relaxation (includes mindfulness meditation) is perceived as the most useful VR treatment by the respondents, with nine out of twelve (100%) indicating that VR can be used for relaxation. In vivo exposure is perceived as useful by eight out of twelve respondents (66.67%). In vivo exposure is a type of therapy that involves gradually exposing a person to their phobias or anxieties in a safe and controlled environment. Imaginary exposure is perceived as useful by seven out of twelve respondents (58.33%). Imaginary exposure is similar to in vivo exposure, but it takes place in the imagination rather than in real life. Cognitive behavioral therapy (CBT) is perceived as useful by six out of twelve respondents (50.00%). CBT is a type of therapy that helps people identify and change negative thoughts and behaviors. Present-centered therapy is perceived as the least useful VR treatment by the respondents, with only two out of twelve (16.67%) indicating that VR can be used for present-centered therapy. Present-centered therapy focuses on helping people live in the present moment and accept their thoughts and feelings without judgment. Diagnosing mental disorders is perceived as useful by three out of twelve respondents (25.00%). Overall, it is suggested that mental health practitioners in this study view relaxation, exposure therapy (in vivo and imaginary), and CBT as the most promising applications of VR in mental health treatment.

Table 3. Perceived usage of virtual reality in mental health interventions

I think virtual reality can be used in the following treatments.	Counts	Total Number of Respondents
Cognitive behavioral	6	66.67 %

therapy (CBT)			
In vivo exposure	7	77.78 %	
Imaginary exposure	8	88.89 %	
Relaxation includes (mindfulness meditation)	9	100.00 %	
Present-centered therapy	2	2.22 %	
Diagnosing mental disorder	3	3.33%	

Table 4 summarizes the perceived usage of virtual reality in mental health treatments according to a research study entitled "Virtual Reality Readiness of Mental Health Practitioners in the Philippines".

Table 4. Familiarity with using VR in mental health interventions

Characteristics	Items	No.
Familiarity with VR applications in MH	Yes, I am aware of VR for MH treatment and have used it in my treatment.	0%
	Yes, I am aware of VR for MH treatment, but I have not used it myself.	8.3%
	Yes, I understand the concept of VR for MH treatment, but I do not know how it works.	16.7%
	Yes, I have heard about the use of VR for MH treatment, but I do not understand the concept or how it works. No, before completing this survey, I had not heard about this at all.	41.7%
		33.3%

Perceptions of Opportunities and Barriers to Adopting in VR Therapy

Performance Expectancy

The response to Performance Expectancy demonstrated a positive attitude towards using VR in therapy. However, most of the respondents were concerned about the 'therapeutic alliance' the therapist's perception of the consultant's attentiveness and supportiveness [12], which was also voiced repeatedly in replies to open questions

'…it involves talking so online synchronous is a good modality to talk in front of the camera provided that there is a stable internet connection.'

'…easier and more comfortable with the service users' cons: unable to see the other nonverbal cues.'

'…there is a barrier since you cannot really see the client face to face.'

The respondents believed that VR therapy could be beneficial for a variety of reasons which include increasing motivation and engagement in treatment, providing a safe and controlled environment for exposure therapy, allowing for more immersive and realistic experiences than traditional therapy methods. They also identified several barriers to adopting VR therapy, such as cost, lack of training for therapists, concerns about the safety and efficacy of VR therapy, and technical difficulties.

Some participants expressed concern that VR therapy could negatively impact the therapeutic alliance between the therapist and the client. They worried that the therapist might become less involved in the session if the client is using VR.

The study suggests that the respondents are generally positive about the potential of VR therapy. Though there are also some concerns about the cost, training, safety, and efficacy of VR therapy, as well as some therapists are worried that VR therapy could negatively impact the therapeutic alliance, further research, development, capacity building, and innovations can be introduced to address these concerns.

Effort Expectancy

The responses exhibited perceptions of ease of use, which has a significant influence on a user's intention to embrace a new technology at its early stages [13]. Participants, however, raised the accessibility issue for people with age, and data connection

'…age of service user.'

'…readiness of clients.'

'…Internet connectivity problems…'

Facilitating Conditions

The responses identified several barriers to VR adoption, including financial costs, difficulty acquiring VR equipment in the workplace, a lack of safety guidelines and privacy regulations, and the demand for adequate training.

'…source of funds for training of the expert and the purchasing of the equipment.'

'…accessibility and affordability.'

'…proper regulations, guidelines and limits as to how much exposure patients are allowed to experience virtual realities. Also, the severity of the condition might be something that's needed to be factored into.'

Social Influence

Responses reflected the mental health culture's reluctance to accept new technologies or treatment modalities in the absence of research-based evidence.

'…data privacy and the plan if the machine/gadget failed to function during the session.'

'…more research findings from the local setting…'

'…providing evidence-based research of its efficacy in the country.'

Table 5. Mean, Median, Standard Deviation and Range Matrix of Readiness Scale for Virtual Reality

	PE	EE	FC	SI

Mean	3.2222	3.8333	3.0000	2.7778
Median	3.1667	4.0000	3.0000	2.6667
Standard deviation	0.4640	0.4330	0.5154	0.8333
Range	1.1667	1.5000	1.7500	2.3333
Minimum	2.5000	3.0000	2.0000	1.6667
Maximum	3.6667	4.5000	3.7500	4.0000

Table 5 describes the MHPs to have somewhat positive views on VR in terms of Effort Expectancy (EE) and Performance Expectancy (PE). However, Social Influence (SI) and Facilitating Conditions (FC) scores are lower, suggesting concerns about social factors and workplace support for VR use. A survey was conducted to gauge mental health professionals' (MHPs') perceptions of virtual reality (VR) as a treatment tool. The survey measured four key variables: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC).

The average scores (mean) for each variable ranged from 2.78 (SI) to 3.83 (EE). This suggests that MHPs, on average, felt most comfortable with how easy VR would be to learn and use (EE). However, their perception of VR's effectiveness in treatment (PE) and the level of support their workplaces would offer (FC) were more neutral. Social influence (SI), which considers how important MHPs believe social factors are for VR use, had the lowest average score. The median scores followed a similar pattern, with Effort Expectancy (EE) being the highest and Social Influence (SI) being the lowest. The standard deviation (SD) for all variables indicated a moderate spread of responses, meaning there wasn't a strong consensus among MHPs on any one variable. While the range of scores for each variable varied slightly, it suggests that some MHPs held very positive views on VR, particularly regarding its potential effectiveness (PE). However, there were also MHPs with concerns, reflected in the lower minimum scores for PE, SI, and FC.

In order to smooth the transition of VR from research labs to the market, this study attempted to investigate how the respondent's experienced VR in the clinical practice. Results show that the respondents have a great deal of experience with using VR in their practice and knowledge of how it may be applied in clinical settings. The increased awareness of developing technology has its influence on the general public. According to Venkatesh et al. (2003), consumers' intentions to adopt new technology are ultimately influenced by their perceived level of technological literacy. The majority of participants (90%) claimed to have incorporated technology into their work in the past, demonstrating their aptitude for and interest in employing technologies, especially emerging ones.

This study investigated the VR readiness of some mental health professionals in the Philippines. While the sample size was limited to 12 participants, the findings offer valuable insights. A majority were female counselors with master's degrees and limited experience with the use of technology, reflecting the demographics of the mental health workforce in the Philippines [14]. Anxiety and depression emerged as the most frequently treated conditions, with a focus on smaller caseloads.

The study revealed a high level of technology integration in current practices. Approximately 75% of MHPs reported utilizing technology, primarily for tele-consultations. Despite encountering challenges like security and connectivity issues, a significant majority (8 out of 9) expressed positive experiences with technology-based interventions. These findings suggest a receptive attitude towards utilizing immersive technology in mental healthcare. Only a quarter of participants lacked basic VR knowledge, and a majority viewed VR as a potentially valuable tool, particularly for relaxation and exposure therapy techniques. Relaxation (including mindfulness meditation) was perceived as the most promising application, followed by in vivo exposure, imaginary exposure,

and cognitive behavioral therapy (CBT). The qualitative data suggests that while mental health professionals in the Philippines see potential in VR therapy, there are also concerns that need to be addressed before widespread adoption. Qualitative analysis revealed a nuanced perspective on VR therapy among Filipino mental health professionals (MHPs). While acknowledging its potential benefits for treatment engagement, exposure therapy, and creating immersive experiences (performance expectancy), participants expressed concerns regarding its potential to negatively impact the therapeutic alliance. This highlights the importance of investigating VR's influence on therapist-client rapport and its functionality to provide immersive experience in future studies. Furthermore, cost emerged as a significant barrier to adoption (facilitating conditions). The financial burden associated with acquiring VR equipment and therapist training necessitates exploring cost-effective solutions and funding opportunities. Accessibility concerns (facilitating conditions) were also raised, particularly regarding suitability for older adults and individuals with limited internet connectivity. This necessitates investigating alternative VR delivery methods and ensuring inclusivity in VR development.

The lack of long-term data on VR's efficacy and safety in mental health treatment (facilitating conditions) underscores the need for further research. Additionally, the absence of clear guidelines and data privacy regulations specific to VR therapy in the Philippines necessitates the development of a robust regulatory framework. Finally, the qualitative data suggests a potential influence of social influence on VR adoption within the Philippine mental health culture. The field's apparent hesitancy towards adopting new technologies without stronger local research evidence suggests a need for collaborative efforts to disseminate research findings and foster a culture of innovation.

This study highlights the need for further research to strengthen the understanding of VR integration within the Philippine mental health landscape. Future studies should employ larger and more diverse samples of MHPs, encompassing a broader range of specialties (e.g., psychologists, psychiatrists, social workers) and geographic locations. This will provide a more comprehensive picture of VR readiness across the Philippines.

Investigating the specific effectiveness of VR therapy for prevalent mental health conditions in the Philippines, such as anxiety, depression, and PTSD, is crucial. Controlled trials comparing VR-based interventions to traditional treatment approaches are warranted to establish evidence-based practice for VR implementation. Additionally, exploring the potential impact of VR therapy on the therapeutic alliance is essential. Qualitative research methods can be employed to understand how VR affects the therapist-client relationship and identify strategies to ensure it remains a strong foundation for treatment success.

Several key strategies can be implemented to facilitate the adoption of VR therapy in the Philippines. Addressing cost remains a critical barrier. Research and development efforts should focus on identifying cost-effective VR technologies and training programs to make VR more accessible to MHPs with limited budgets. Collaboration with technology companies and exploring grant opportunities could provide valuable funding mechanisms. Accessibility considerations are also paramount. Investigating alternative VR delivery methods that cater to individuals with limitations related to age, internet connectivity, or potential disabilities is crucial. Advocating for inclusive VR development practices that address these considerations will ensure broader patient access to this technology. The establishment of a robust regulatory framework is vital for ethical and safe VR use in therapy. Collaboration with relevant stakeholders, such as government agencies and mental health professional associations, is necessary to develop clear guidelines and data privacy regulations specific to VR therapy in the Philippines. This will foster a responsible and secure VR implementation environment. Finally, fostering a culture of innovation within the Philippine mental health field is critical. Disseminating research findings, both local and international, through workshops and conferences can facilitate knowledge exchange among MHPs. This will encourage continuous learning and exploration of VR's therapeutic potential within the Philippine context.

CONCLUSION AND RECOMMENDATION

This study emphasizes the positive impression of immersive technology to be used in the mental healthcare system in the Philippines. MHPs demonstrated openness to this emerging technology. Future research with larger and more diverse samples is warranted to explore the specific applications and effectiveness of VR therapy within this cultural context. Additionally, investigating the factors influencing technology adoption among Filipino MHPs could provide valuable insights to inform broader VR implementation strategies in global mental health care. The qualitative analysis suggests a cautious optimism among Filipino MHPs regarding VR therapy. While

acknowledging its potential benefits, they identify cost, accessibility, safety, training, regulations, and cultural factors as key challenges to widespread adoption. Addressing these concerns and conducting further research on VR's effectiveness in the Philippine context are crucial steps towards integrating VR into mainstream mental health treatment.

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