The Effect of Virtual and Augmented Reality on Well-Being: Perspectives in Mental Health Education

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Abstract The paper is an analysis of the impact of metareality on the human mind and its adverse and therapeutic effects on psychological well-being thereof. Metaverse is marked by a blurring of boundaries between the actual physical world and the virtual digital world—a metareality reflected in a three-dimensional, multisensory experience. Based on research evidence, the paper discusses how applications within virtual and augmented reality, such as, the gaming platforms present potential risks and significant safety challenges. There are ethical risks in the metaverse that are related to identity crisis, uninhibited behaviour, and unleashing of sexual and aggressive impulses. At the macro level, the real-time robust mechanisms of this simulated parallel universe impact various societal domains, such as, home, family, religion, and spirituality. The literature review presented highlights the need for digital safety and the prevention of online abuse by launching safe zones and safety tools. However, studies highlight that there are dialectical mechanisms inbuilt in metaverse and these are manifest in its innate therapeutic capacity. Researchers have reported that the imaginal, embodied, and connectivity aspects of this digital reality form the basis for treatment of psychological ailments. The conceptual framework developed will serve as a foundation for researchers interested in studying the link between augmented reality and its effect on the psyche of the human user. The paper has implications for mental health awareness and education which include debunking of associated myths, inculcating of active interest in designing interventions for patient recovery, and for individual growth at the societal level in a digitally transformed world.

Keywords Mental health education · Psychotherapy · Virtual reality · Avatar · E-health · Behaviourally based treatments

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1 Introduction

Artificial intelligence as a technology has enabled machines to simulate human behaviour through sophisticated algorithms, thus making possible the construction of virtual and augmented reality together referred to as 'metaverse' or 'metareality'. This digital transformation, apart from impacting other domains has added a new dimension to all the three areas of mental health education viz. Psycho-education, Treatment, and Support and Advocacy [1]. Psycho-education, the informational part of mental health education, should now incorporate teaching people about the risk factors and symptoms associated with various mental health conditions caused by the adverse impact of virtual reality and its various forms.

Technology has assisted as well as obstructed the progress of mankind. The new innovation 'Meta' or 'Metaverse' is another leap into the ever expanding field of information technology. 'Meta' is a Greek word for 'beyond' and 'verse' is the short form of the word 'universe'. Facebook CEO Zuckerberg has rebranded it as 'Meta' which relates to 3D virtual augmented reality made up of applications enabling individuals to work, play, and travel from one place to another virtually. This virtual 3D reality looks boundaryless—a world of endless possibilities. The vision and mission of the Meta Company is to enable people to connect and businesses to grow by going beyond 2D screens towards profoundly immersive experiences in a materialistic world. "The metaverse will feel like a hybrid of today's online social experiences, sometimes expanded into three dimensions or projected into the physical world. It will let you share immersive experiences with other people even when you can't be together, and do things together you couldn't do in the physical world. It's the next evolution in a long line of social technologies, and it's ushering in a new chapter for our company" [2]. 'Metaverse', typically, is a composite term that includes, Artificial Intelligence (AI), Virtual Reality (VR), Augmented Reality (AR), Blockchain, and the 5th generation mobile network (5G). Researchers [3] have symbolized metareality as Janus—the Roman God of all forms of transition and of beginnings and endings—depicted by two faces looking in opposite directions.

Based on a review of literature, the present study aims to study the significance of mental health education in the context of:

1. The adverse impact of virtual and augmented reality on mental health.
2. The therapeutic applications of virtual and augmented reality.

2 Virtual and Augmented Reality: Impact on Mental Health

Metaverse and its applications are still in the nascent stage. A potent question is whether this wide open digital space is a safe place for a vulnerable demographic like children and adolescents. The effects or pitfalls of the virtual world for both work and recreation, created by augmented reality are much more pronounced as compared to

those resulting from social media usage. The element of immersion being far greater in the metaverse, the issues of bullying, harassment, self-esteem, and body image get aggravated [4]. According to Rizzo [5], there is a difference in perceiving and interacting with a digital world through a 3D screen than a flat two-dimensional monitor. The level of realism in this metareality may be 'psychologically assaulting' in some instances. The 3D digital avatars help young users to project a fake version of themselves which may result in an identity crisis. Fictionalizing one's identity makes other people's opinion about the self more important. Talking to CNBC Make It, Clinical Psychologist Mitch Prinstein says that metaverse platforms are creating more loneliness and far more body image concerns due to exposure to dangerous content that's related to suicidality [4].

Companies like Roblox, Epic Games, and VRChat have launched online games that can be played through 3D headsets. Gaming is an apt representation of the metaverse which shows evidence of dangers for young users. In a research study [6], it was found that VRChat—the popular social app in Facebook's VR Metaverse exposes minors to abuse, harassment, racism, and graphic sexual content every 7 min. For instance, recreating of shooting episodes on Roblox and exposing children to these is highly unethical. Despite Zuckerberg's pledge that privacy and safety will be an integral part of Virtual Reality, Facebook Meta's VR policies fail to mitigate these risks. CCDH researchers found that 11 h and 30 min of recordings of user behaviour in VRChat showed 100 potential violations of Facebook's VR policies. Meta was unresponsive to almost half of these violations.

The multimodal character of the metaverse increases the possibility of stranger intrusion manifolds in comparison to social network sites like facebook and instagram wherein only messaging is possible thus limiting unwanted conduct. In virtual space, the stranger will appear closer and more impinging. Haptic gloves, for instance, can increase interconnectedness on the one hand and abuse on the other hand. Virtual groping is a serious side effect of the introduction of the tactile sense in immersive reality. Such incidents have been reported on Horizon Worlds—a virtual reality social media platform [7]. Although the body is not touched in such a case, yet it feels real and generates a feeling of powerlessness because virtual reality space gives an illusion of physical space. It is immersive and real, so the toxic behaviour that occurs in that environment is also real. Furthermore, virtual currencies can proliferate immoral activities online such as kids using their avatars to enter virtual strip clubs in exchange for 'Robux'—a virtual currency. According to a report [8], the decentralized control and independence of cryptocurrency from financial institutions ensures its anonymity making the purchase of Child Sexual Abuse Material (CSAM) in exchange easier.

Researchers [9, 10] uphold the proposition that metaverse has major psychosocial effects and the potential to shake the ethical core of society. Koltko-Rivera [9] talks about three societal domains that are likely to be impacted by metaverse and the observations that follow are based on inferences drawn by him through a comprehensive literature review.

1. Private Experience: He gives a detailed account of how virtual and augmented reality affect various societal and personal domains. His interpretation is largely

based on the Freudian approach to personality and on the nature of the experiential context in which users find themselves. He rightly predicted that the period 2005–2025 will reflect a change in the VR mainframe with a very complex user-virtual technology interface where all sensory modalities will be engaged. The experiential context within which the users function will be a simulation but will appear very close to reality. The research questions raised by the researcher are based on the dialectics of metaverse viz. its negative aftereffects and the opposing positive consequences.

Explaining the private experience of individuals in the virtual environment, [9] takes recourse to Freudian Psychoanalytic theory [11]. Freud talked about two powerful primal impulses: 'eros' (the life instinct linked with sexuality and aggression) and 'thanatos' (the death instinct). All civilization, he said, has occurred through the suppression, repression, and sublimation of the primal urges of sex and aggression. Socialization is all about taming the Id—the primitive, immoral aspect of the self—often referred to as the "beast in man". The Id functions on the 'pleasure principle' and seeks immediate gratification. Social learning is all about enabling the child to delay gratification of his needs and desires. However, an exposure to the metaverse is about undoing the process of socialization because individuals can unleash their primitive desires and seek instant virtual fulfilment without immediate socio-legal consequences which might make them less inhibited in the real world. The dialectically opposite result could be that of metaverse being cathartic and leading to a more balanced and focused self. However, due to individual differences in personality configurations, there will be differential outcomes. The issues of impulse control are particularly salient in relation to extra-punitive or outwardly directed aggression. In an exhaustive review, [12] found that exposure to virtual violence increased the incidence of immediate as well as long-term harm-inflicting behaviour and so did participation in a violent VR game [13]. However, [14] upholds that the outlets provided by virtual simulation rather purge feelings of aggression, making individuals more peaceful.

The fulfilment of sexual needs in metareality, getting married in virtual scenarios and the realization of sexual fantasies does not involve the risk of sexually transmitted diseases. Calvert [15] found that individuals indulge in safe sex and also learn skills that enhance sexual intimacy. In simulated sex, the partners are imaginary AI characters and not humans and virtual sexual encounters with avatars are likely to lead to positive effects. However, Hyde and DeLamater [16] maintains that learning to develop mature adult sexual relationships may not transfer to the real world. Calvert [15] recognizes the ethical risks of over-exposure to and easy availability of sexual content in metaverse. The immersive sexual activities may particularly reinforce sadism in sexual deviants because of disinhibition and desensitization similar to that seen in consumption of violent pornographic films [17]. Issues of marital infidelity and betrayal may lead to a weakening of familial bonds and a consequent increase in divorce rate and social instability [18].

2. Home and Family: A virtual family life and simulated relationships are likely to shake the very institution of marriage. For a single individual with a virtual extended family and an attractive, caring partner, this arrangement may be ideal for overcoming loneliness and stress. But it is likely that fewer people will marry because of unrealistic expectations from people in the real world which will ultimately affect birth rate. This kind of 'escape from reality' will be beneficial to a limited extent because individuals will fail to deal with the frustrations of real life. The question, however, requires much empirical research.

3. Religion and Spirituality: Metaverse can enable individuals to connect to their faith communities in virtual space, worship their Gods as they come alive, and also incarnate them. Out of the five dimensions of religion and spirituality given by Glock [19], knowledge and ritual are greatly influenced by VR. The holy discourse becomes more enriching because of VR's immersive quality and it gives the freedom to conduct any ritual anywhere, any time, and by anyone. There are two ramifications in this regard: one, spirituality might become more of a private affair lacking in the communal spirit and two, there is a risk of the proliferation of self-proclaimed, pseudo-religious communities of avatars of real world humans or AI constructs which may disrupt the religious foundations of societies.

Metareality has been likened to 'maya'—a Sanskrit word for 'magic' or 'illusion'—and a central concept in Hindu philosophy [20]. The Hindu religion talks of 'maya' as signifying an ephemeral, materialistic, changing world replete with desires of all kinds. In Vedic texts, it denotes a magic show where things are not the way they appear. The digital world personified as 'maya' offers a number of choices but not the choice to escape from it. An individual once caught in this web of desires, metaphorically, is not able to attain 'Nirvana' which in Buddhism is liberation from all sufferings and the quenching of worldly desires.

3 Virtual and Augmented Reality: Therapeutic Applications

Research shows a strong linkage between clinical and health psychology on the one hand, and metaverse on the other hand. The different aspects of virtuality have implications for mental health care, such as in the treatment of depression, chronic pain, phobias, stress-induced ailments, and eating disorders, to name a few. E-health interventions are behaviourally based treatments that are transformed into a digital format and delivered via the internet. Ventura et al. [21] view virtual and augmented reality from three vantage points which help to understand the effectiveness of Information and Communication Technologies (ICTs) used in cybertherapy:

1. VR/AR as an imaginal technology where users feel that they are in the real world when actually they are not.

2. VR/AR as an embodied technology where individuals experience their whole being immersed inside the virtual environment.
3. VR/AR as connectivity technology where geographical boundaries do not matter and people can connect across time and space.

As per [21], the imaginal dimension of metaverse enables mental visualization and imagery which results in the creation of a perceptual experience where sense organs are not actually stimulated by any form of physical energy and is like looking from the mind's eye [22]. VR exposure therapy leads to systematic desensitization and is particularly effective in the treatment of phobias. The harmful flashback-type mental images in PTSD, for example, can be replaced by positive, pleasant images. The patient can come face to face with virtually recreated images leading to a diminishing of negative emotional effects associated with these. Within the systematic desensitization framework, the patient's anxiety is made to increase through confrontation with the aversive stimuli. For example, the feeling of heights in the safe simulated environment, can help to treat acrophobia [23]. An intervention to treat flying phobia designed by Botella et al. [24], includes 3 stages of healing: (1) Pre-flight experience in a living room where the patient can virtually pack, listen to weather news, buy the flight ticket, etc.; (2) Before-flight experience at the airport where the patient can hear boarding announcements and see planes landing and taking off; (3) On-flight experience in the airplane where sitting inside the plane, the patient can experience takeoff and landing in adverse conditions.

The avatars created through augmented reality are descriptive of the embodied aspect of metaverse. These are people's representations in the virtual world through which they can watch themselves and do things that they have never done before [25] including the learning of adaptive behaviours. One application worth mentioning in this context and highlighting the therapeutic effect of AR is about treatment of insect phobia [26]. AR-cockroaches software using computer vision techniques activates the feared virtual environment and cockroaches appear in the hands of the patient. During the exposure session, the therapist can control the number, movement, and size of cockroaches. The main advantage is that this reduces the patient's resistance for therapy since he can see his own body in the safe environment and interact with the feared stimuli [26].

There have been studies where participants could see their own body and a look-alike in virtual space. This technique enabled them to talk to themselves and build self-esteem in the process. In other scenarios, the other body was that of a therapist to whom the patient could communicate his psychological problem and seek solutions. He could also switch positions and look at his mental state through the therapist's perspective. Results showed high level of sense of embodiment [27]. Studies have also shown how changing the perspective, and living experiences from other bodies, can promote empathy, and even compassion and self-compassion in persons with high self-criticism and depression [28] and also reduce racial prejudices through self-identification with a black avatar [29]. Still another study found how participants digitally represented as Superman became pro-social and altruistic [30].

The connectivity dimension of metaverse helps people to share experiences. Computer-mediated communication (CMC) has constructed a simulated social space, called cyberspace [31] which has 2 salient features: interaction and connection. A sense of self and a personal brand can be built based on these features. Online therapy programme was not preferred by people because of a lack of skilled clinician and also geographical distance. The new virtual technologies have helped to overcome these barriers. Videoconferencing, for example, simulates real-life psychotherapy where the clinician does not appear distant and the therapeutic alliance is also not impaired [32]. VR with all its utility features is a step midway between the therapist's office and the real world [33].

4   Conceptual Framework

The conceptual framework derived from the aforementioned studies will serve as a tool for researchers interested in unearthing the psychological phenomena associated with digital reality. Based on empirical evidence, policies and procedures aiming at digital safety and well-being can be devised. It can be seen in Fig. 1 that the three facets of virtual and augmented reality viz. imaginal, embodied, and connectivity lead to both adverse and therapeutic effects and this awareness is crucial to mental health education which encompasses psycho-education, treatment, and support and advocacy.
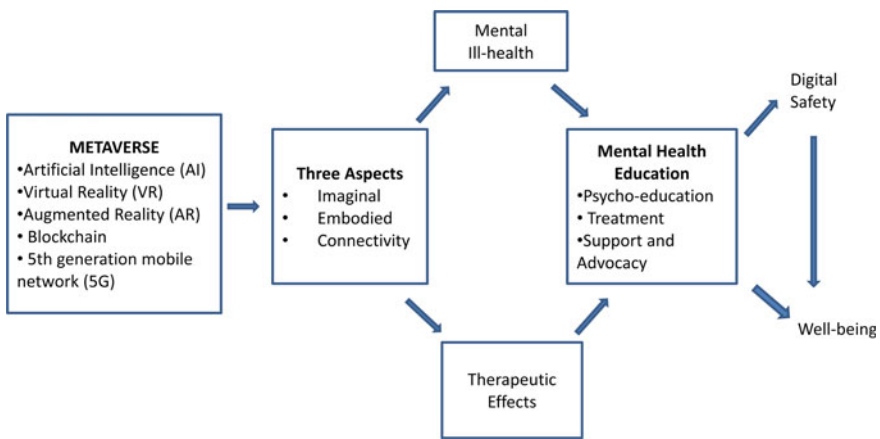

Fig. 1 Conceptual Framework. Source: Author

5   Conclusion

In the end, the issue of digital safety is what needs to be addressed. Tech companies and content creators focus only on the commercial benefits of metaverse. Knowing that it is a double-edged sword, tech companies can build antidotes or solutions into the metaverse products which can, in fact, have a healthy effect on impressionable minds. Strict age verification tools can prevent predators from impersonating as younger users. The presence of content moderators and rapid response to reported violations can deter inappropriate behaviour in virtual space. Regulatory bodies need to incentivize companies that use the metaverse for social progress rather than only for profit. It is the responsibility of tech companies to prioritize the safety of their users over their own incentive to earn a profit. It is critical that metaverse technologies, both software and hardware, have built-in structures and frameworks that ensure safety, privacy, confidentiality and security of the users and their identity. Ecosystems of trust can also be created through policies and regulations. Despite this, safety policies can be difficult to monitor and enforce in virtual spaces. New illnesses have emerged due to the adverse impact of virtual reality and so have new treatments. The associated risk factors have enhanced the importance of mental health education be it in schools, in communities or to health providers or at the workplace.

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