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The 360° beach video: a supporting mindfulness intervention with virtual reality

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ABSTRACT

This article describes optimizing of virtual reality (VR) with a 360° beach video model used for mindfulness interventions. Using VR with 360° beach videos to support the presence of an immersive environment can effectively support mindfulness practices. Students are interested in the integration of technology in school counseling. VR helps in creating immersive environments such as forests, beaches, waterfalls, etc, so that students more focu on practicing mindfulness and attention at the current moment. This article focuses on optimizing 360° beach videos in the breathing mindfulness process so that it helps bring out real experiences. Obstacles to practicing mindfulness include lack of focus, mind wandering and not concentrating. The use of 360° beach videos with VR can increase focus and be more effective in mindfulness practice.

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1. INTRODUCTION

Nowadays, technology development reach counselling area on its intergration in therapeutic intervention and to support therapy process. The implementation of online counseling can be optimized by communicating via computer when therapy is given to clients [1]. The aplications of digital tools, platforms and devices is effective in providing cognitive behavioral therapy, for example during better assessment, formulation, treatment, training and monitoring. So digital technology is widely used in psychotherapy. There are many types of digital-based interventions, such as using mobile applications, chat, websites and other types which have been proven to be used in providing treatment to clients who experience mental health disorders [2]. Counseling interventions can be carried out using personal computers and smartphones because they can make it easier for clients to access [3]. Several technologies that have been used in psychotherapy or mental health counseling services such as chat messages, AI, chat bots, and some mobile applications provide effectiveness in digital mental health services. Gaffney *et al.* [4] explained that providing digital therapy using a computer has an effect on providing innovative treatment. One example is the use of virtual reality (VR) and mixed reality as an innovation in the field of psychotherapy [5]. Apart from that, the researchers also recommend interdisciplinary collaboration in clinical science, for example when applied to clients who experience anxiety [6]. The impact of increasing empathy in the counseling treatment process is detected automatically in online counseling sessions [7], so that online counseling does not leave the counselor's counseling skills in the intervention process.

The trend of integrating technology in counseling has been growing for years. The potential success of effective online counseling includes increasing the accessibility and efficacy of mental health interventions [8]. Apart from many articles showing the efficacy of technological development in the field of education, this is a challenge to be able to do it in schools for the provision of counseling services by school counselors [9]. The trend of using technology is attractive, especially for students since it can improve the quality of counseling services, establish good report cards, increase counselor interaction with clients and can also be used as a self-help service for individual who needs mental health support [10]-[12]. Despite many advantages in psychotherapy, there are challenges in integrating it into counseling. Counselors or therapists need to develop new skills in operating technology in the intervention process. The challenge of optimizing therapeutic skills in a virtual environment also needs to be increased so that interventions can be effective and successful.

The benefits of e-counseling are suitable to apply in schools since students (young people) are more familiar with internet. The attitude of school counselors can influence how counselors have self-efficacy and digital resilience in using online counseling at school [13]. Apart from that, how effective cyber counseling can be in helping high school students increase self-actualization and is suitable tp apply to students who have introvert personality tendencies. Online counseling is very effective for students to be more open when told online. The online counseling interventions can be useful if there is limited time for face-to-face counseling services which require time and are more economical [14]. The urgency of technology-based counseling can be implemented in the school environment to improve students' support and welfare.

2. VIRTUAL REALITY IN THE COUNSELING AREA

Foon *et al.* [13] emphasized that the importance of school counselors in implementing online counseling can be carried out regularly and improve the quality of services provided. Professional practice can be supported by the use of technology so that counselors can explore innovation and student needs. School counselors organize how successful and effective counseling interventions are by integrating technology in providing treatment. The technology used by counselors facilitate administrative tasks and also provide effective counseling service programs [15]. In the field of school counseling programs, the integration of digital tools and technology is widely applied. Research emphasizes the importance of school counselors incorporating e-counseling into practice to increase the effectiveness of services, especially considering the high use of the Internet among students. Nowadays, children and teenagers are more interested in technological developments, so school counselors can quickly adapt to evolving digital experiences.

3. VIRTUAL REALITY INTEGRATION INTO MINDFULNESS

The trend of mindfulness research with the integration of technology is increasing. Proven research results support that digital-based mindfulness can support individuals in managing holistic health conditions and achieving well-being [16]. Therefore, mindfulness applications can improve mental well-being, reduce stress levels and mindfulness models can be developed in various regional characteristics. The integration of technology with VR used in mindfulness practice can be applied in the scope of education and special education. The sophistication of VR has been proven to improve metacognition skills [17]. Mindfulness intervention is very relevant to be applied in various populations because it also has an impact, for example when applied in schools it can improve students' academic performance. Technology-assisted mindfulness can help students to achieve mental health and well-being.

The applications of using VR mindfulness in facilitating the relaxation process is successful. Chavez *et al.* [18] stated that the use of technology in meditation provides benefits in increasing visualization, interactivity and sensory engagement to optimize the meditation experience and strengthen concentration. VR technology has potential to help individuals achieve to relaxation, reduce stress, and improve emotional states by creating a conducive environment. Mao *et al.* [19] have tested the significant effectiveness of using VR using mindfulness techniques applied to dialectical behavior therapy. The immersive nature of VR provides clients with the illusion of "being there" generated by a computer, in line with the main principle of mindfulness which emphasizes awareness of the present moment. It has been proven that VR can be applied in diverse client populations and shows positive results in reducing symptoms of depression, anxiety and other mental illnesses [20].

4. METHOD

This study is a systematic literature review that employs specific criteria for selecting articles to be examined. The primary data sources for this study are Sciencedirect and SpringerLink Journal. The criteria

for the articles include the query: (“360-degree video” OR “immersive video” OR “virtual reality”) AND (“beach” OR “coastal” OR “ocean”) AND (“mindfulness” OR “meditation” OR “relaxation”). The chosen population consists of clinical or non-clinical human subjects, with interventions focused on mindfulness, relaxation, or meditation, and results related to these interventions. The search was limited to publications from 2020 to 2024, specifically targeting research articles within the scope of social sciences and the sub-scope of psychology. PICO of this research (Population: user experience; Intervention: 360° beach video in virtual reality as a mindfulness intervention; Comparasion: traditional mindfulness techniques; Outcome: improvement in mindfulness, and enhancement of focus and relaxation). The research question: How does the use of a 360° beach video in virtual reality contribute to enhancing mindfulness practice?.

5. RESULTS

Based on the PRISMA analysis results (Haddaway *et al.* [21]). A total of 5,328 articles were identified as shown in Figure 1, which then analyzed, yielding the following results. The results of the seven articles reviewed are presented in the Table 1 [22]-[28], see in Appendix.

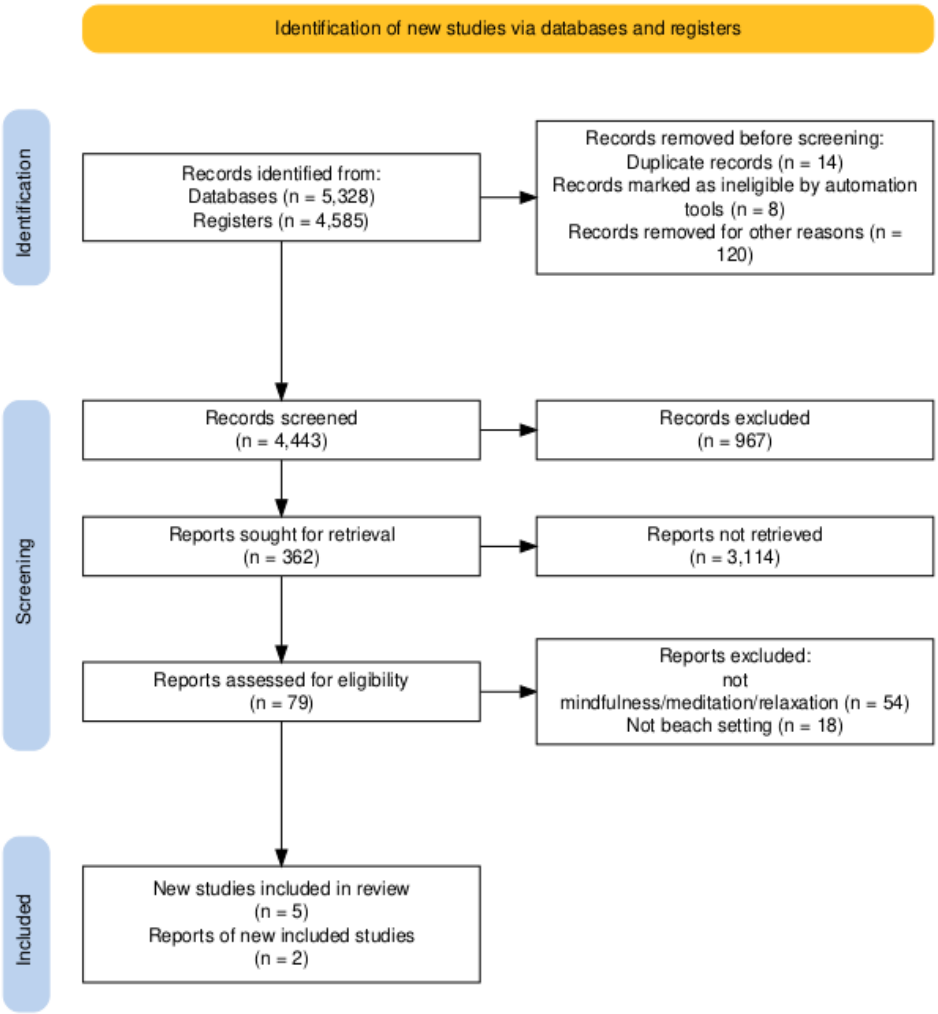

Figure 1. PRISMA flow diagram

6. DISCUSSION

6.1. How immersive virtual reality works and its correlation to counseling practice?

Baghaei *et al.* [29] show stages that can be used in the treatment of mental health disorders, such as carrying out diagnosis and treatment, counselors can use virtual reality. The VR technology is able to offer special experiences in helping to validate symptoms and experimental treatment approaches in adult clients

who experience mental health disorders [30]. Morever, the use of VR can improve evaluation and therapy for health problems experienced by elderly people. Intervention can also be effective using virtual reality. This means that VR can be used in interventions not only for teenagers but also for elderly people.

Mindfulness practices are continually being developed, including being integrated with VR in practice [31]. This helps attract clients to practice mindfulness because it provides an immersive environment and also limits distractions from the real world [32]. The focus on enjoying moment by moment adds value to the advantages of VR because it supports a sense of complete presence [33]. Gomez *et al.* [34] added that the success of mindfulness practice is facilitated by the ease of users in operating virtual reality, including for beginners, with the emergence of a supportive atmosphere for practicing mindfulness. Sepang *et al.* [35] stated that the effect of mindfulness meditation facilitated by VR increased the client's sense of calm. this relates to VR experiences influencing embodiment and participation in neurorehabilitation [36]. VR creates multisensory stimulation and the illusion of reality, so it can help individuals in virtual environments that significantly influence the client's perception of self and body. This study also examined the application of VR in therapy for individuals with dysthymia and its impact on mindfulness meditation.

VR has been recognized for its ability to regulate the human sensory and emotional systems, thus presenting a special way to provide mindfulness interventions [37]. The integration of VR into mindfulness interventions can offer more engaging and interactive experiences, potentially leading to better outcomes in anxiety management, stress reduction, and overall well-being [19]. By utilizing immersive and interactive VR attributes, individuals can interact with mindfulness more vividly and engagingly, thus increasing the effectiveness of mindfulness practices [35]. Navarro-Haro *et al.* [31] explained that the acceptability and feasibility of using VR in supporting mindfulness practice was found to be a very supportive tool. That is what makes VR superior to other tools, namely providing interesting platform features, increasing a sense of acceptance, awareness and real presence, and reducing external distractions. Dixon *et al.* [38] highlight the advantages of training people in immersive VR, suggesting that VR can offer an organized and accurate depiction of the natural world that is favorable to opportunities for iterative learning.

For mindfulness optimization process, VR features help improving attention in mindfulness practice. They cite research showing that applying mindfulness in nature-based VR environments can exert a short-term restorative effect on attention, thus making it a more engaging practice. The interaction design of mindfulness meditation with VR is an innovative method for expressing and understanding the meditation experience. This includes increasing of happiness and controlling anxiety after practicing mindfulness with VR [20]. They argue that VR offers an immersive setting for moment-to-moment attention and focus training, enhancing the sensation of attention in a personalized virtual environment. Apart from that, Heyse *et al.* [39] described that the use of VR in meditation can create a new environment through VR with the support of making it easier to achieve successful mindfulness practice.

6.2. 360° beach mindfulness videos

Utilizing the immersive and engaging aspects of VR technology is critical to creating a natural environment for clients to practice mindfulness as shown in Figure 2. Research has shown that immersing people in natural virtual environments can significantly reduce stress levels [40]. Natural scenic images have positive impact on relaxtion process [41]. When integrating elements of nature into mindfulness, practices that use VR can further enhance the benefits of relaxation and therapeutic. Immersive VR environments, such as forests, beaches, or mountains, can enhance calmness and connection to nature in mindfulness practices, such as being in real environments [20]. Thus, by integrating nature into virtual reality, mindfulness practice can amplify the calming effect of the practice and foster a deep sense of relaxation and well-being. Studies have shown that these videos can increase empathy and awareness among learners [42].

Research shows that 360° videos increase the impression of presence compared to traditional 2D videos, thereby increasing credibility and engagement with content. The use of 360° video in an educational environment is essential. The increased sense of presence can be very beneficial when aiming to influence environmental behavior [43]. The immersive experience of using VR can reduce mind wandering and encourage deep mindfulness practice [44]. The 360 videos can increase feelings of empathy on mindfulness practice [42]. Rupp *et al.* [45] investigated subjective learning outcomes and experiences in 360° video as the effectiveness in enhancing educational experiences. It shows that 360° video can be an effective tool for mindfulness practices and other contexts where empathy and understanding are being fostered. Tran *et al.* [46] investigated the quality of experience aspect of 360° video, focusing on the quality of acceptance, perception, presence, and cyber-disease.

The function of watching 360° videos in creating an immersive environment that can be applied in various settings, including on mindfulness practices with a beach video as a background [47]. In addition, according to previous opinions, Sabir *et al.* [48] provide a perspective regarding the omnidirection offered by 360° videos which can foster experiences and deepen clients' understanding of material when used in

mindfulness sessions. This view can help clients feel more connected to nature and the surrounding environment like a real environment. The use of immersive 360° videos to evoke empathetic responses can improve users' attentions. This emotional connection might be essential in fostering a feeling of calm and connection during a beachside mindfulness practice [49].

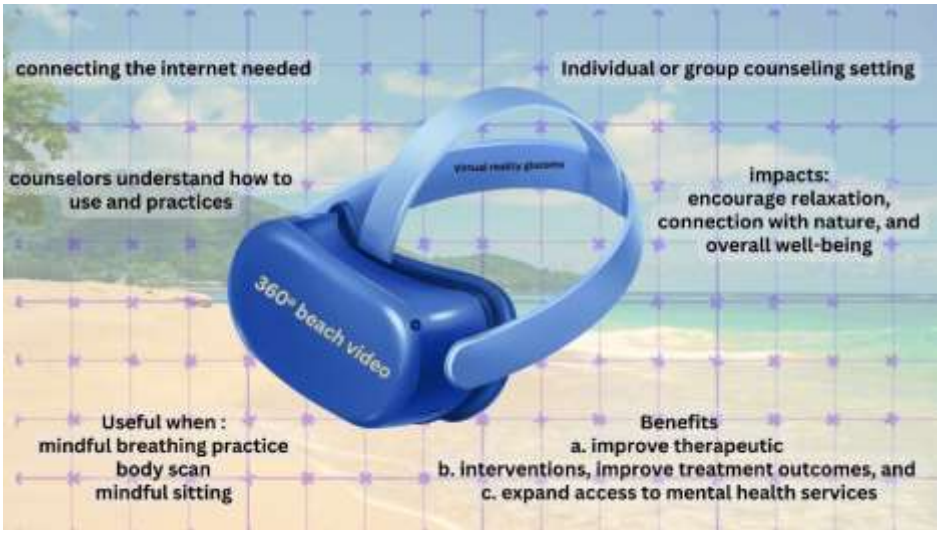

Figure 2. Model 360° beach video with VR indfulness practice

In the context of user perception and attention, the 360° VR videos can directly attract users' attention. This aspect is especially important when designing mindfulness videos for the beach since capturing and maintaining the user's focus is essential to guide them to perform relaxation exercises effectively [50]. By including prominent visual elements in beach awareness videos, practitioners can create engaging and immersive experiences for clients. Visual preferences analysis in 360° videos show that certain visual features can significantly influence users' attention. 360° video offers a unique and engaging way to deliver content in a variety of domains, from education to counseling [51]. Clients' ability to create immersive experiences, enhance user perception, and evoke empathy makes them valuable tools for communication, learning, and even counseling. When using 360° video, the adaptability and scalability of streaming need to be prepared as it affects the delivery of high-quality content over a dynamic network environment [52].

7. CONCLUSION

School counselors need to be more responsive and adaptive to technological developments. Technological integration and innovation can be optimized in school counseling programs to improve support services to students and facilitate administrative management. School counselors can adapt their needs in efforts to prevent problems, develop themselves, and respond to problems experienced by students. School counselors provide students' interest in counseling services at school with the help of technology to address time limited-service, increase openness, self-help, and the effectiveness of services that cannot be provided face-to-face. The integration of VR into mental health services presents transformative opportunities to improve therapeutic interventions, improve treatment outcomes, and expand access to mental health services. By offering immersive and personalized experiences, VR has the potential to completely change how mental health issues are diagnosed and handled. The 360° video may enhance user experience, fostering empathy, increasing attendance, facilitating learning, and creating immersive environments for mindfulness practice. So, further research recommendation is developing integrative tools with VR to help mindfulness intervention effectively. However, the other environments setting for option to support meditation need to create more type of settings like waterfall, forest, cave, or desert. The future researcher can develop model for mindfulness intervention to enhance some character strengths with VR for adolescence.

APPENDIX

Table 1. Table of systematic literature review analysis results

Author	Topic	Subject	Setting	Results
Van Doren *et al.* [22]	Negative and positive affect	Veterans in Residential	Skies and auroras, beach retreats, lost in the desert	The intervention showed advantages over traditional mindfulness practices by minimizing distractions and enhancing a sense of safety. Thematic analysis shows that the intervention helped participants focus on the present, promoting calmness and reducing negative emotions
Bridge *et al.* [23]	Mental wellbeing	Nursing and allied health profession (NAHP) students undertake	3D tropical beach environment	The relaxing beach setting facilitated mindfulness meditation, and students appreciated the opportunities for pseudo-anonymous interactions with peers and tutors.
VanLone *et al.* [24]	Persecutory delusion	Patients with psychosis	Beach, forest, or lake	Both VR interventions showed similar effectiveness, even though they were designed to target different mechanisms. Both had high uptake rates and led to significant improvements in persecutory delusions, but it remains unclear if the treatments directly caused these changes
Riches *et al.* [25]	Relaxation experience, happiness, and connectedness to nature, and decreases in stress, anxiety, and sadness	Inpatients and outpatients with acute psychiatric conditions	Beach	Patients reported that the VR sessions were enjoyable, relaxing, and helpful. Therapists also gave positive feedback but noted some practical challenges. During the implementation of VR, violent incidents and restrictive practices were reduced by half. Overall, VR relaxation seems feasible and acceptable in acute services. Larger studies are needed to assess its potential impact on psychiatric wards.
Olasz *et al.* [26]	Perception of time, psychological and physiological states	Young people	Beach environment (Costa del Sol)	The effectiveness of electronic device-supported mindfulness for stress reduction, indicating no significant difference between VR and tablet-supported exercises.
Cawley and Tejeiro [27]	Stress	University students	a courtyard in Japan, a woodland campfire, a beach on a desert island, or beside a lake).	A brief session of VR mindfulness provides short-term benefits for those at high risk of stress, more than coloring and audio mindfulness.
Lovell and Wetherell [28]	Stress	Parents of children with autism	Beach and forest	VR simulations of relaxing natural environments effectively improve mood and reduce perceived stress for up to seven days in caregivers of children with autism.

REFERENCES

[1] D. Richards, "Developments in technology-delivered psychological interventions," *Universitas Psychologica*, vol. 12, no. 2, pp. 571–579, Aug. 2013, doi: 10.11144/Javeriana.UPSY12-2.dtdp.

[2] S. Berrouiguet, E. Baca-García, S. Brandt, M. Walter, and P. Courtet, "Fundamentals for future mobile-health (mHealth): a systematic review of mobile phone and web-based text messaging in mental health," *Journal of Medical Internet Research*, vol. 18, no. 6, p. e135, Jun. 2016, doi: 10.2196/jmir.5066.

[3] N. S. Bonfiglio, M. L. Mascia, S. Cataudella, and M. P. Penna, "Digital help for substance users (SU): a systematic review," *International Journal of Environmental Research and Public Health*, vol. 19, no. 18, p. 11309, Sep. 2022, doi: 10.3390/ijerph191811309.

[4] H. Gaffney, W. Mansell, and S. Tai, "Conversational agents in the treatment of mental health problems: mixed-method systematic review," *JMIR Mental Health*, vol. 6, no. 10, p. e14166, Oct. 2019, doi: 10.2196/14166.

[5] S. Graham *et al.*, "Artificial intelligence for mental health and mental illnesses: an overview," *Current Psychiatry Reports*, vol. 21, no. 11, p. 116, Nov. 2019, doi: 10.1007/s11920-019-1094-0.

[6] J. Ma, D. Zhao, N. Xu, and J. Yang, "The effectiveness of immersive virtual reality (VR) based mindfulness training on improvement mental-health in adults: A narrative systematic review," *Explore*, vol. 19, no. 3, pp. 310–318, May 2023, doi: 10.1016/j.explore.2022.08.001.

[7] Bo Xiao, Z. E. Imel, P. G. Georgiou, D. C. Atkins, and S. S. Narayanan, "'Rate My therapist': automated detection of empathy in drug and alcohol counseling via speech and language processing," *PLoS ONE*, vol. 10, no. 12, p. e0143055, Dec. 2015, doi: 10.1371/journal.pone.0143055.

[8] A. Zale *et al.*, "Technology and psychotherapeutic interventions: bibliometric analysis of the past four decades," *Internet Interventions*, vol. 25, p. 100425, Sep. 2021, doi: 10.1016/j.invent.2021.100425.

[9] L. I. Akunne, A. V. Etele, V. N. Nwadinobi, and J. A. Akuezuilo, "Integration of digital technology in rendering counselling services in Nigeria," *Asian Journal of Education and Social Studies*, pp. 77–88, Jun. 2022, doi: 10.9734/ajess/2022/v29i330703.
[10] K. C. Ukaoha, J. Ndunagu, F. B. Osang, "A guidance and counseling mobile application (GC Mobile App) for educational institutions," *NIPES Journal of Science and Technology Research*, vol. 2, no. 3, p. 293, Aug. 2020, doi: 10.37933/nipes/2.3.2020.29.
[11] E. E. Soares, J. N. Thrall, T. N. Stephens, R. R. Biglieri, A. J. Consoli, and E. L. Bunge, "Publication trends in psychotherapy: bibliometric analysis of the past 5 decades," *American Journal of Psychotherapy*, vol. 73, no. 3, pp. 85–94, Sep. 2020, doi: 10.1176/appi.psychotherapy.20190045.
[12] J. Stoll, J. A. Müller, and M. Trachsel, "Ethical issues in online psychotherapy: a narrative review," *Frontiers in Psychiatry*, vol. 10, Feb. 2020, doi: 10.3389/fpsyt.2019.00993.
[13] L. W. Foon, Z. N. Zainudin, Y. M. Yusop, and W. N. W. Othman, "E-counselling: the intention, motivation and deterrent among school counsellors," *Universal Journal of Educational Research*, vol. 8, no. 3 3C, pp. 44–51, Mar. 2020, doi: 10.13189/ujer.2020.081605.
[14] N. K. Suarni, I. K. Dharsana, and G. N. Sudarsana, "Effect of cyber counseling on increasing self-actualization of high-school students in Buleleng, Bali," 2019, doi: 10.4108/eai.21-11-2018.2282220.
[15] E. C. M. Mason, C. Griffith, and C. T. Belser, "School counselors' use of technology for program management," *Professional School Counseling*, vol. 22, no. 1, p. 2156759X1987079, Jan. 2018, doi: 10.1177/2156759x19870794.
[16] L. A. Avalos *et al.*, "A mobile health mindfulness intervention for women with moderate to moderately severe postpartum depressive symptoms: feasibility study," *JMIR Mental Health*, vol. 7, no. 11, p. e17405, Nov. 2020, doi: 10.2196/17405.
[17] M. R. Costa, J. Felver, and R. Razza, "Supporting mindfulness based interventions with social virtual reality," in *Proceedings of 2019 the 9th International Workshop on Computer Science and Engineering, WCSE 2019*, 2020, pp. 238–245, doi: 10.18178/wcse.2019.06.036.
[18] L. J. Chavez *et al.*, "Virtual reality meditation among youth experiencing homelessness: Pilot randomized controlled trial of feasibility," *JMIR Mental Health*, vol. 7, no. 9, p. e18244, Sep. 2020, doi: 10.2196/18244.
[19] W. Mao, W. Chen, and Y. Wang, "Effect of virtual reality-based mindfulness training model on anxiety, depression, and cancer-related fatigue in ovarian cancer patients during chemotherapy," *Technology and Health Care*, vol. 32, no. 2, pp. 1135–1148, Mar. 2024, doi: 10.3233/THC-230735.
[20] E. Mitsea, A. Drigas, and C. Skianis, "Mindfulness for anxiety management and happiness: the role of VR, metacognition, and hormones," *Technium BioChemMed*, vol. 3, no. 3, pp. 37–52, Sep. 2022, doi: 10.47577/biochemmed.v3i3.7343.
[21] N. R. Haddaway, M. J. Page, C. C. Pritchard, and L. A. McGuinness, "PRISMA2020: an R package and Shiny app for producing PRISMA 2020-compliant flow diagrams, with interactivity for optimised digital transparency and open synthesis," *Campbell Systematic Reviews*, vol. 18, no. 2, Jun. 2022, doi: 10.1002/cl2.1230.
[22] N. Van Doren, H. Ng, E. Rawat, K. R. McKenna, and D. M. Blonigen, "Virtual reality mindfulness training for veterans in residential substance use treatment: Pilot study of feasibility and acceptability," *Journal of Substance Use and Addiction Treatment*, vol. 161, p. 209315, Jun. 2024, doi: 10.1016/j.josat.2024.209315.
[23] P. Bridge *et al.*, "A virtual reality environment for supporting mental wellbeing of students on remote clinical placement: a multi-methods evaluation," *Nurse Education Today*, vol. 138, p. 106184, Jul. 2024, doi: 10.1016/j.nedt.2024.106184.
[24] J. VanLone, J. Freeman, T. LaSalle, L. Gordon, T. Polk, and J. R. Neves, "A practical guide to improving school climate in high schools," *Intervention in School and Clinic*, vol. 55, no. 1, pp. 39–45, Sep. 2019, doi: 10.1177/1053451219832988.
[25] S. Riches *et al.*, "Integrating a virtual reality relaxation clinic within acute psychiatric services: a pilot study," *Psychiatry Research*, vol. 329, p. 115477, Nov. 2023, doi: 10.1016/j.psychres.2023.115477.
[26] O. Olasz, S. Erdős, and K. Horváth, "The effects of virtual reality-based mindfulness exercises on the perception of time, psychological and physiological states of young people: a randomized crossover trial," *Mindfulness*, vol. 15, no. 9, pp. 2347–2354, Sep. 2024, doi: 10.1007/s12671-024-02438-y.
[27] A. Cawley and R. Tejeiro, "Brief virtual reality mindfulness is more effective than audio mindfulness and colouring in reducing stress in university students," *Mindfulness*, vol. 15, no. 2, pp. 272–281, Feb. 2024, doi: 10.1007/s12671-024-02306-9.
[28] B. Lovell and M. A. Wetherell, "Do virtual reality relaxation experiences alleviate stress in parents of children with autism? A pilot study," *Journal of Child and Family Studies*, vol. 33, no. 7, pp. 2134–2141, Jul. 2024, doi: 10.1007/s10826-024-02876-1.
[29] N. Baghaei, H. N. Liang, M. Billinghurst, J. Naslund, and O. Oyekoya, "Editorial: virtual reality and mental health: opportunities to advance research and practice," *Frontiers in Virtual Reality*, vol. 3, Feb. 2022, doi: 10.3389/frvir.2022.838036.
[30] A. C. Huynh and I. Grossmann, "A pathway for wisdom-focused education," *Journal of Moral Education*, vol. 49, no. 1, pp. 9–29, Jan. 2020, doi: 10.1080/03057240.2018.1496903.
[31] M. V. Nararro-Haro *et al.*, "The use of virtual reality to facilitate mindfulness skills training in dialectical behavioral therapy for borderline personality disorder: a case study," *Frontiers in Psychology*, vol. 7, no. Nov, 2016, doi: 10.3389/fpsyg.2016.01573.
[32] M. V. Navarro-Haro *et al.*, "Evaluation of a mindfulness-based intervention with and without virtual reality dialectical behavior therapy® mindfulness skills training for the treatment of generalized anxiety disorder in primary care: a pilot study," *Frontiers in Psychology*, vol. 10, no. JAN, Jan. 2019, doi: 10.3389/fpsyg.2019.00055.
[33] A. Flores, M. M. Linehan, S. R. Todd, and H. G. Hoffman, "The use of virtual reality to facilitate mindfulness skills training in Dialectical behavioral therapy for spinal cord injury: a case study," *Frontiers in Psychology*, vol. 9, no. APR, Apr. 2018, doi: 10.3389/fpsyg.2018.00531.
[34] J. Gomez *et al.*, "The use of virtual reality facilitates dialectical behavior therapy® 'observing sounds and visuals' mindfulness skills training exercises for a Latino patient with severe burns: a case study," *Frontiers in Psychology*, vol. 8, no. SEP, Sep. 2017, doi: 10.3389/fpsyg.2017.01611.
[35] L. Sepang, J. Lambani, R. Tandiseru, I. G. Purnawinadi, and A. Wahyudi, "Virmentalness: prototype of therapy for dysthymia patients using virtual reality," *CogITo Smart Journal*, vol. 7, no. 2, pp. 329–338, Dec. 2021, doi: 10.31154/cogito.v7i2.346.329-338.
[36] D. Perez-Marcos, "Virtual reality experiences, embodiment, videogames and their dimensions in neurorehabilitation," *Journal of NeuroEngineering and Rehabilitation*, vol. 15, no. 1, p. 113, Dec. 2018, doi: 10.1186/s12984-018-0461-0.

[37] X. S. Hu *et al.*, "Brain mechanisms of virtual reality breathing versus traditional mindful breathing in pain modulation: Observational functional near-infrared spectroscopy study," *Journal of Medical Internet Research*, vol. 23, no. 10, p. e27298, Oct. 2021, doi: 10.2196/27298.
[38] D. R. Dixon, C. J. Miyake, K. Nohelty, M. N. Novack, and D. Granpeesheh, "Evaluation of an immersive virtual reality safety training used to teach pedestrian skills to children with autism spectrum disorder," *Behavior Analysis in Practice*, vol. 13, no. 3, pp. 631–640, Sep. 2020, doi: 10.1007/s40617-019-00401-1.
[39] J. Heyse, M. T. Vega, T. De Jonge, F. De Backere, and F. De Turck, "A personalised emotion-based model for relaxation in virtual reality," *Applied Sciences (Switzerland)*, vol. 10, no. 17, p. 6124, Sep. 2020, doi: 10.3390/app10176124.
[40] S. McGarry, A. Brown, M. Gardner, C. Plowright, R. Skou, and C. Thompson, "Immersive virtual reality: an effective strategy for reducing stress in young adults," *British Journal of Occupational Therapy*, vol. 86, no. 8, pp. 560–567, Aug. 2023, doi: 10.1177/03080226231165644.
[41] J. Amores, R. Richer, N. Zhao, P. Maes, and B. M. Eskofier, "Promoting relaxation using virtual reality, olfactory interfaces and wearable EEG," in *2018 IEEE 15th International Conference on Wearable and Implantable Body Sensor Networks, BSN 2018*, Mar. 2018, vol. 2018-January, pp. 98–101, doi: 10.1109/BSN.2018.8329668.
[42] K. Newman, P. K. Kahlon, and S. Li, "Raising nursing student awareness of how it feels to have dementia with the use of 360º video," *Journal of Nursing Education and Practice*, vol. 11, no. 2, p. 7, Oct. 2020, doi: 10.5430/jnep.v11n2p7.
[43] I. Cikajlo, U. C. Staba, S. Vrhovac, F. Larkin, and M. Roddy, "A cloud-based virtual reality app for a novel telemindfulness service: rationale, design and feasibility evaluation," *JMIR Research Protocols*, vol. 6, no. 6, p. e108, Jun. 2017, doi: 10.2196/resprot.6849.
[44] M. V. Navarro-Haro *et al.*, "Meditation experts try virtual reality mindfulness: a pilot study evaluation of the feasibility and acceptability of virtual reality to facilitate mindfulness practice in people attending a mindfulness conference," *PLoS ONE*, vol. 12, no. 11, p. e0187777, Nov. 2017, doi: 10.1371/journal.pone.0187777.
[45] M. A. Rupp, K. L. Odette, J. Kozachuk, J. R. Michaelis, J. A. Smither, and D. S. McConnell, "Investigating learning outcomes and subjective experiences in 360-degree videos," *Computers and Education*, vol. 128, pp. 256–268, Jan. 2019, doi: 10.1016/j.compedu.2018.09.015.
[46] H. T. T. Tran, N. P. Ngoc, C. T. Pham, Y. J. Jung, and T. C. Thang, "A subjective study on user perception aspects in virtual reality," *Applied Sciences (Switzerland)*, vol. 9, no. 16, p. 3384, Aug. 2019, doi: 10.3390/app9163384.
[47] J. Li, R. Feng, W. Sun, Z. Liu, and Q. Li, "QoE-driven coupled uplink and downlink rate adaptation for 360-degree video live streaming," *IEEE Communications Letters*, vol. 24, no. 4, pp. 863–867, Apr. 2020, doi: 10.1109/LCOMM.2020.2966193.
[48] R. I. Sabir, M. B. Majid, and K. Masood, "Impact of student wellness on academic performance with mediating role of learning environment," *Academic Journal of Social Sciences (AJSS)*, vol. 5, no. 4, pp. 419–435, 2021.
[49] M. Hollick, C. Acheampong, M. Ahmed, D. Economou, and J. Ferguson, "Work-in-progress-360-degree immersive storytelling video to create empathetic response," in *Proceedings of 2021 7th International Conference of the Immersive Learning Research Network, iLRN 2021*, May 2021, pp. 1–3, doi: 10.23919/iLRN52045.2021.9459340.
[50] H. Choi and S. Nam, "A study on attention attracting elements of 360-degree videos based on VR eye-tracking system," *Multimodal Technologies and Interaction*, vol. 6, no. 7, p. 54, Jul. 2022, doi: 10.3390/mti6070054.
[51] M. S. Lee, S. H. Baek, Y. J. Shim, and M. J. Lee, "Analysis of object-centric visual preference in 360-degree videos," *IEEE Access*, vol. 9, pp. 98026–98038, 2021, doi: 10.1109/ACCESS.2021.3095284.
[52] A. Yaqoob, T. Bi, and G. M. Muntean, "A survey on adaptive 360° video streaming: solutions, challenges and opportunities," *IEEE Communications Surveys and Tutorials*, vol. 22, no. 4, pp. 2801–2838, 2020, doi: 10.1109/COMST.2020.3006999.

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