

the behavioral and mental health of individuals provides a way for evidence-based care and person-centered care to merge under a single umbrella of process-based care. Orienting the field in that direction may ultimately be the most important “changed shore” produced by the third wave of CBT.

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The use of virtual reality in psychosis research and treatment

Recent years have witnessed a renewed interest and an increase in the popularity of virtual reality, the aim of which is to generate a virtual world that feels immersive and realistic. The user wears a head mounted display, and computer generated images and sounds are synchronized with his/her movements.

The potential of virtual reality for mental health research, assessment and treatment is that it enables researchers and clinicians to bring real-time life experiences into a lab environment. In standard practice, i.e. not in a virtual reality environment, the assessment of clinically relevant phenomena – such as neurocognitive processes, emotional reactions, physiological activation or behavioural responses – involves standardized questionnaires, semi-structured interviews about symptoms, doing computer tasks, watching videos or images, or role playing a situation while the physiological response is measured. Although the reliability and validity of these methods have been tested extensively, they lack ecological validity and do not represent the complexity of real life experiences¹.

The innovative potential of virtual reality is that it allows to measure real-time cognitive, emotional, physiological and behavioural responses to a variety of “real-life” situations, while enabling experimental control.

Till recently, the high cost of virtual reality equipment and software as well as cyber-sickness, a side effect associated with the older head mounted displays, have represented a major barrier to the implementation of virtual reality in standard practice. As head mounted displays have become popular devices for entertainment and gaming, they are increasingly affordable, so that implementation of virtual reality in daily clinical practice has come within reach.

Enthusiasm is growing among clinicians and researchers around the world about the potential that virtual reality offers to improve the assessment and treatment of mental and physical health problems. Fortunately, this technique has been around for over half a century and has been used in psychology research for well over 25 years². A significant body of research has also explored its use for the assessment and treatment of different mental health problems, ranging from phobias, to eating disorders, autism and post-traumatic stress disorder³.

A substantial number of studies have been conducted to establish the safety of using virtual reality with people experiencing psychosis and to elucidate the psychological mechanisms underlining the onset and maintenance of psychotic symptoms⁴. In this type of studies, participants enter a virtual environment, like public transport or a café, populated by avatars who show behaviours which can be interpreted as ambiguous, like for example looking at the participant and looking away. The occurrence of paranoid ideation or hallucinations triggered during the virtual reality experience is then assessed.

The use of virtual reality for the clinical assessment and treatment of psychosis is still in its infancy, but the first clinical trials have been published or are ongoing. In these studies participants either practice new social skills⁵, or are encouraged to drop their safety behaviours and explore new ways of approaching social situations^{6,7} or challenge the omnipotence of the voices they hear⁸. The initial results indicate that virtual reality assisted therapy can be a powerful tool to help people break the cycle of avoidance involved in the maintenance of symptoms and develop new skills and strategies to cope with them. They also show that improvements are maintained at follow-up.

Although the coming years are exciting times for the development and implementation of virtual reality for psychosis, our enthusiasm should not prevent us from considering safety and ethical concerns associated with this technique. Moreover, it is essential to emphasize that all research to date has evaluated the use of virtual reality as an adjunct to standard procedures with a therapist guide and not as a stand-alone intervention which patients can download and follow on their own.

Rigorous research is needed to confirm the initial positive findings regarding the use of virtual reality assisted assessment and therapy. To date most research in psychosis has focused on paranoia and hallucinations, and there is an urgent need to explore the use of virtual reality for negative symptoms. Future studies should integrate virtual reality with physiological measures (e.g., galvanic skin response, cortisol levels, heart rate) to better understand the mechanisms that trigger and maintain psychotic symptoms. Research endeavours should also inves-

investigate whether combining virtual reality assisted therapy with wearables and phone apps could help overcoming the barrier between treatment room and daily life.

A new exciting area of research is exploring the use of virtual reality in the training of army medical personnel to increase resilience when deployed to war zones and prevent the onset of mental health problems⁹. Moving forward this approach will be interesting to investigate the use of virtual reality in the training of mental health staff to improve their skills in recognizing and treating psychosis.

Virtual reality could also play a crucial role in researching resilience factors to stressful events in relation to different mental disorders and could inform the development and implementation of prevention strategies. A multi-disciplinary understanding of the mechanisms involved in the onset and maintenance of psychosis that draws connections between psychology, psychiatry, neuroscience, education, computer science and gaming technology will inform core research questions, such as the following: How does emerging psychosis affect behaviour in social situations? How can social environments be effective in building resilience and improving well-being of young people at ultra-high risk for psychosis? How can we use virtual reality in teaching settings to educate young people about early signs of mental health problems? To achieve these ambitious goals, we need to break down the invisible barriers between academia, health providers and new technology industry. We also need to embrace new flexible

research designs to evaluate the effectiveness of these continuously evolving technologies¹⁰.

To conclude, a comment about augmented reality. While virtual reality head mounted displays immerse the user in an artificial world, augmented reality displays superimpose virtual images to the real world so that both are visible at the same time. Augmented reality is in development and has enormous potential for training and education as well as for health applications in the next two decades.

For a video example of the use of virtual reality with psychosis, please watch a documentary at <https://www.youtube.com/watch?v=DeLBb7BYJ9E>.

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Mental health Internet support groups: just a lot of talk or a valuable intervention?

Over the past 15 years there has been a rapid growth in research demonstrating the effectiveness of online cognitive behavioural interventions for the treatment of common mental disorders¹. There has been substantially less professional and research interest in Internet support groups (ISGs) that provide peer-to-peer support to individuals with a mental illness. This is surprising given the widespread availability and popularity of ISGs² and the recommendation in at least one leading clinical practice guideline that individuals with depression be advised of self help and support groups³.

ISGs provide an accessible form of support regardless of geographical location or time of the day. They enable anonymous participation and may facilitate engagement of individuals with symptoms (such as social anxiety) which hinder face-to-face interaction. Online groups differ in whether or not they are overseen by mental health professionals or moderated to ensure members adhere to the rules of the group. Some groups are synchronous, enabling real-time conversations between users, although most are asynchronous, involving sequential posts and delayed responses.

Support groups, including ISGs, are typically seen as a device for facilitating recovery among people with mental illness. In this context recovery is characterized not as the elimination of symptoms but rather as living a hopeful, contributing and satisfying life⁴. Nevertheless, there is some high quality evidence of the effectiveness of ISGs in reducing depressive symptoms, with a large randomized controlled trial showing a greater reduction of depressive symptoms in the medium and long term following an ISG intervention than an attention control condition⁵. Such evidence is consistent with survey research reporting user-perceived reductions of depressive symptoms with depression ISG use⁶. Further, consistent with hypotheses that ISGs may contribute to recovery, the above ISG trial found a greater short-term increase in perceived empowerment among the ISG than the control group⁷.

Other reported benefits of depression ISGs, emerging from user self-reports and qualitative analysis of user posts, include improved daily functioning, reduced isolation, and increased professional help seeking and knowledge of medications⁶. Qualitative evidence suggests that users value the emotional