Neurofeedback & Wellness: An exploratory study of the experiences and perceptions of the impact of neurofeedback therapy on mental well-being

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Abstract

"Believe it or not, you really can change your brain" (Cohen M, 2020, p.27).

***Background**: Mental health concerns are increasing worldwide, and these can substantially affect all areas of life* (World Health Organisation, 2022). *Prior studies have indicated that neurofeedback therapy has significantly improved mental health 75-80% of the time (Hammond, 2011). This study aims to understand, through participants' experiences and perceptions, whether neurofeedback therapy has an impact on mental well-being.*

***Method:** A qualitative study using thematic analysis was conducted with eight individuals who participated in neurofeedback therapy between 2020 and 2023.*

***Results:** A thematic analysis (Braun & Clarke, 2006) identified themes consistent across all participants relating to the positive impact of neurofeedback therapy, particularly, broad themes that described the therapy as **"life-changing"**, "**having a positive impact on brain health**" and a strong belief that this therapy could **"benefit others"**.*

***Conclusion:** This research validates that the experiences of neurofeedback participants are congruent with the findings of previous studies on neurofeedback and offer opportunities for future research highlighting the positive impact of neurofeedback therapy and improving the accessibility of this ground-breaking therapy.*

Neurofeedback & Wellness: An exploratory study of the experiences and perceptions of the impact of neurofeedback therapy on mental well-being

The past century has been plagued with numerous life-altering events, including the effects of the COVID-19's pandemic to multiple wars across the globe. Mental health has deteriorated, with the World Health Organisation (WHO) declaring an increase in mental health conditions worldwide, affecting school or work performance, relationships with family, friends, and community participation (World Health Organisation, 2022). Treatment strategies to enhance mental health interventions have been prioritised with limited success, resulting in a call to rethink classical, traditional intervention methods and consider the potential of new concepts and modern technologies (Taschereau-Dumouchel et al., 2022). Neurofeedback is a potential alternative for patients where traditional options fall short (Ros et al., 2014).

Neurofeedback is a non-invasive therapy which teaches self-control of brain functions (Marzbani et al., 2016), encouraging the brain to develop healthier patterns through feedback mechanisms. During neurofeedback, electrodes are placed on the scalp to monitor specific brain functions and symptoms (Hammond, 2011), the neural activity is measured using electroencephalographic (EEG) signals, and a visual, auditory, or other representation is presented to the participant in real-time (Sitaram et al., 2016). Participants can assess and control their progress to achieve optimal results (Marzbani et al., 2016).

Neurofeedback therapy has been widely used in treating various mental disorders such as Attention Deficit Disorder/Attention Deficit Hyperactivity Disorder (ADD/ADHD), depression, anxiety, fibromyalgia and for cognitive enhancement (Gunkelman & Johnstone, 2005). While some studies have shown that significant improvements occur 75-80% of the time (Hammond, 2011), the clinical efficacy of neurofeedback is still debated. Neurofeedback's potential is, however, recognised in innovative therapy and psychiatric research (Batail et al., 2019).

There is currently limited formal research or documentation on how participants of neurofeedback therapy perceive the impact of this therapy on their mental well-being. Informally solicited feedback and documented experiences indicate the potential for neurofeedback to be used more. Neurofeedback is not recognised as a therapy by South African medical aids but is recognised as a growing field supporting multiple conditions. Further research could support this therapy's validity and enable future funding through healthcare providers. This study therefore aims to understand, through participants' experiences and perceptions, whether neurofeedback therapy has an impact on mental well-being.

Literature review

The brain is one of the most complex organs to evolve in humans (Schoenemann, 2006), and, although once thought 'fixed', recent research has revealed its dynamic, flexible, and adaptable nature (Kays et al., 2012). Neuroscience studies of the brain have shown that neurons can adapt to restore previously damaged functions, taking on additional functions to improve abilities (Kleim, 2011). This capacity to reorganise itself to adapt to intrinsic and extrinsic stimuli is known as neuroplasticity (Cramer et al., 2011).

There is growing evidence that neuroplasticity could be used to promote healing and recovery in critical brain functions (Kays et al., 2012) and, therefore, overall mental well-being. Neurofeedback is a neurocognitive therapy closely related to neuroplasticity as it helps patients learn to regulate their brain's electrical activity (Batail et al., 2019). It has been lauded as a powerful method to trigger brain plasticity (Loriette et al., 2021), harnessing electroencephalography (EEG), a technique used to study the electrical activity of the brain as well as detect abnormal patterns in brain activity (Cohen, 2017).

Neurofeedback was first developed during the study of electroencephalographic signals of brain events during operant conditioning studies (Kamiya, 2011). Neurofeedback is based on operant conditioning, where real-time brain control

through sensory feedback channels provides a positive consequence to positive behavioural outcomes reinforced through repetition (Ros et al., 2014). This has also been linked to the control-theoretical framework, a model for the self-regulation of human behaviour and cognitive factors linked to neurofeedback learning (Enriquez-Geppert et al., 2017).

While undergoing neurofeedback, the participant has electrodes placed strategically to monitor brain function and symptoms (Hammond, 2011) while their neural activity is measured via EEG with visual and auditory feedback immediately relayed to the participant (Sitaram et al., 2016). Positive brain patterns are rewarded with a clear image or auditory output which then rewire brainwaves to act in response to these stimuli. Participants can monitor and control progress using the EEG and its mapping, thus permitting self-regulation of neural activity and the subsequent improvement of cognitive functions, symptoms and behaviour as a result (Weber et al., 2020).

A key strength of neurofeedback over traditional therapies and treatments is its direct control of brain oscillations (Ros et al., 2014) through operant conditioning. A 2022 South African study exploring the experiences of neurofeedback therapists in treating attention-deficit hyperactivity disorder (ADHD) revealed that participants acknowledged an overall positive impact from neurofeedback on ADHD, anxiety and insomnia (Oliveira et al., 2022). Thematic analysis revealed core themes that neurofeedback is an effective treatment method for ADHD and that the use of

neurofeedback was beneficial to enhancing therapeutic relationships and treatment. However, there was widespread frustration regarding the lack of awareness about neurofeedback as a valid alternative form of therapy. While the study was aimed at specific conditions, the results are congruent with other studies that indicate the value of neurofeedback as beneficial for a wide range of neuropsychiatric disorders (Orndorff-Plunkett et al., 2017a, 2017b; Reiter et al., 2016).

When considering holistic well-being, sleep cannot be negated. In line with the findings of the South African neurofeedback study (Oliveira et al., 2022), other studies have also confirmed the positive impact of neurofeedback on sleep. In a pilot study of 13 participants suffering from insomnia, participants were exposed to twenty sessions of neurofeedback over 12 to 15 weeks (Garcia et al., 2020). Participants reported a significant improvement in sleep patterns, confirmed by sleep data indicating that participants slept over an hour more than their norm, which was considered statistically significant. While the sample size for this study is too small to be generalised across a large population, the finding is congruent with other studies supporting the positive role of neurofeedback on sleep and, therefore, overall well-being (Hammer et al., 2011; Krepel et al., 2022).

Multiple studies have confirmed the association between cognitive performance and psychological well-being, especially concerning positive mental health (Ali et al., 2013; Fuhrmann et al., 2022; Jokela, 2022). This implies that improving cognitive

performance could lead to a positive impact on mental well-being. A systematic review of the effect of cognitive training with neurofeedback on a wide range of cognitive functions in healthy individuals has revealed enhanced cognitive performance post-sessions (Matsuzaki et al., 2023). This study included a multi-level meta-analysis, including 166 participants who were exposed to neurofeedback with cognitive training, resulting in enhanced working memory and long-term memory performance, implying an indirect positive impact on well-being. Cognitive ability, linked to academic performance, has improved through neurofeedback therapy in a study of nursing students (Mohammadi et al., 2023). The study consisted of 60 participants divided into control and experiment groups of 30 each, with the experiment group receiving neurofeedback, after baseline testing. The results of covariance testing showed that students with previous academic failure in the experiment group showed a higher average academic score than the control group who did not receive neurofeedback therapy (11.02 on the pretest and 12.83 on the posttest following neurofeedback therapy, while the control group scores remained the same posttest). This study was localised to a specific group of nursing students within a university and cannot be generalised across all populations, however, the results are congruent with other studies indicating improvements in cognitive abilities post-neurofeedback (Loriette et al., 2021) and, subsequently, positively impacting mental well-being (Ali et al., 2013; Fuhrmann et al., 2022; Jokela, 2022).

A randomised controlled clinical study of ADHD children was performed at the Child and Adolescent Mental Health Clinic in Norway, to evaluate the effectiveness of

neurofeedback in the treatment of ADHD (Duric et al., 2012). The study grouped the ADHD patients into three control groups: one included medication, another neurofeedback treatment, and, the final group, a combination of medication and neurofeedback treatment. While 30% of the subjects dropped out of the study, the outcome across all three groups showed improvement in symptoms of ADHD (Neurofeedback group more than double the pre–post change in attention). This study implies that neurofeedback treatment could be as effective as medical treatment and a promising alternative for those who respond negatively to medication.

A systematic review and meta-analysis of ten clinical trials, conducted by Askovic et al (2023) revealed that neurofeedback had beneficial effects on post-traumatic stress disorder (PTSD) symptoms and a positive impact on secondary outcomes such as depression and anxiety, while other studies (Van Der Kolk, 2014) showed that neurofeedback was successful in the treatment of complex PTSD. Increasing and lengthening neurofeedback sessions resulted in a positive effect on arousal, anxiety, depression, and intrusive, numbing, and suicidal thoughts (Choi et al., 2023). Other studies have shown that women suffering from anxiety treated with neurofeedback, compared with a control group, experienced reduced anxiety symptoms (Soleymani et al., 2021). Trauma, depression, and anxiety have a profound impact on one's mental well-being.

There are limited studies evaluating how participants perceive the impact of neurofeedback. One's perception and treatment experience are essential determinants of well-being (Arboleda, 2023), making it necessary to understand the experience of those participating in neurofeedback. One study focused on the experiences of neurofeedback therapists (Oliveira et al., 2022), while other studies focused on the mechanism of neurofeedback and its effect (Balt et al., 2020; Bekker et al., 2021). This study aims to understand, through participants' experiences, whether there is a perceived impact on well-being due to neurofeedback therapy.

Method

Design

To understand how individuals experience neurofeedback therapy, a qualitative study using thematic analysis was conducted. This approach allows for deeper insights into participants' experiences and perspectives and is therefore ideal when understanding one's experience of neurofeedback therapy. Thematic analysis was used to extract meaningful patterns within the data and permitted a flexible theoretical approach while simultaneously allowing for unanticipated insights (Braun & Clarke, 2013). Thematic analysis was instrumental in this study as it encouraged the exploration of different perspectives from various participants, highlighting similarities and differences in their experiences.

The analysis process was guided by Braun and Clarke's (2013) guidelines for thematic analysis. The first step involved familiarisation with the data, which was done while transcribing the video to compile the written transcripts. To ensure a precise transcript, the video was reviewed numerous times for accuracy, allowing particular questions and breeding familiarity with the data.

An inductive "bottom-up" approach (Braun & Clarke, 2013) was used to ensure that the data formed the basis of the exploratory study without any preconceived view of what the participants' perspectives may be. A complete coding process was used to

ensure that everything of interest was captured using semantic codes. The next step involved systematically reviewing the transcript to identify and summarise key concepts (codes) across the data sets.

Once the coding was complete, Braun and Clarke's (2013) guidelines led the search for larger patterns and again grouped the codes into broader themes using an inductive data-driven approach. Using a colour coding system allowed for grouping that could later be organised into common themes.

Finalising the themes led to the last stage of report writing, where the researcher was conscious of ensuring that personal sentiments on the topic did not result in bias. The entire process was iterative, and despite the step-by-step linear guidelines (Braun & Clarke, 2013), there was continuous review and reflection between phases, establishing trust with the data (Nowell et al., 2017).

Participants

The study sample consisted of eight individuals from South Africa currently participating in or had participated in neurofeedback therapy over the past year, all 18 years and older. Due to the detailed nature of the questions, the sample size was expected to be at most ten people and reached saturation point at eight participants, when the richness of the data no longer provided unique insight into the perceived

experience of neurofeedback therapy and wellness. This small sample size ensured a close examination of the participants' experiences (Smith & Osborn, 2015) and perceptions of well-being caused by neurofeedback therapy. The participants consisted of two males and six females, from South Africa with two from Johannesburg, and six from Cape Town. Refer to Appendix J for further details.

Materials

This qualitative research study gathered data through in-depth semi-structured interviews with an interview schedule constructed, containing nine open-ended questions to allow participants to highlight further points (refer to Appendix C for the interview schedule).

The interview explored the participants' thoughts, feelings, and perspectives regarding their neurofeedback experience (Rogers & Willig, 2017). The primary intent was to explore how neurofeedback impacted the participants' overall well-being, with experience referring to the impression of well-being that neurofeedback left them and their perception relating to whether they believed that neurofeedback impacted positively on their mental well-being. In line with understanding the participants' experiences, the initial questioning generally concerned why they chose to partake in neurofeedback and what they had hoped to gain. Subsequent questions related to how they felt following their neurofeedback experience and their general state of well-being after this therapy. This particular question aimed to assess whether their

participation in neurofeedback therapy was related to specific wellness issues and, therefore, a basis for treatment (Orndorff-Plunkett et al., 2017a, 2017b; Reiter et al., 2016).

Procedure

A sample of registered neurofeedback therapists within the Johannesburg area in South Africa were briefed and engaged to assist in recruiting participants engaged in neurofeedback therapy. An advertisement was published in the latest Neurofeedback of South Africa newsletter.

Once candidate participants made contact via email, the study investigator informed participants of the interview's intention and provided them with an information sheet and an informed consent sheet for signature. The details of the study were clearly articulated to maintain complete transparency on the study's intent and participants were allowed an opportunity to ask questions.

The study investigator interviewed participants for 30-40 minutes using Microsoft Teams. The interviews were recorded for later transcription. The participants were asked to respond to semi-structured questions concerning their neurofeedback therapy experience and how they perceive the impact of this therapy on their well-

being. Upon conclusion, the interviewer read a debriefing statement and delivered concluding remarks.

Ethics

The Brunel University ethics committee approved this study (REF: 43174-MHR-JUL2023-46388-2) in alignment with ethical considerations. The Biofeedback Association of South Africa was consulted for local approval. Practitioners were advised to ensure participants were of sound body and mind to avoid potentially causing undue stress. Participants were closely monitored during the video interview for body language and expressions that depicted signs of stress; the interviewer was careful to pause the conversation when these scenarios occurred. Participants were advised that they could stop at any time.

Anonymity was maintained by replacing all names and identifying information with pseudonyms in the transcript process. These participants were emailed a detailed participant information sheet containing critical details about the study. Interviews were confidential, with appropriate non-disclosure and confidentiality maintained. Participants were required to sign these forms before proceeding with the interviews.

Results

This study aimed to understand how neurofeedback participants experienced this therapy in the context of their well-being. A thematic analysis of data gathering during semi-structured interviews revealed three major themes with multiple associated sub-themes.

The themes identified are:

(1.) Life-changing experiences

(2.) Impact on the brain and healing

(3.) Accessibility and benefits

Theme 1: Life-changing experiences

Multiple participants described their experience with neurofeedback as "life-changing", with all participants affirming that it positively impacted their well-being. The reference to "life-changing" differed in form from general confidence or reduction of anxiety to overall positive mood and, in some cases, even included the elimination of medication dependence related to mental well-being.

"I would stress how profound an effect neurofeedback has had in my life… I just couldn't find a way …Truly positive intervention in my life." (Mike)

Participants reported an overall improvement in their state of mind and emotional well-being after at least six neurofeedback therapy sessions.

"Six weeks or so into starting neurofeedback, your mood lifts and your brain fog starts to disappear or comes less." (Luke)

This improvement in mood had a cascading effect on other parts of their well-being, contributing to overall positive mood. Some participants described the positive impact of neurofeedback on depression and anxiety, despite being treatment-resistant to medication.

"Whilst I still do experience anxiety, certainly, there has been an easing, and I would say that I definitely feel it has had a positive effect on my mental well-being, and things like mood and the like." (Mike)

Adequate sleep plays a vital role in overall health and well-being. As indicated by most of the participants, neurofeedback therapy had a positive impact on sleep patterns. Some participants struggled to sleep for long periods and indicated significant improvements following neurofeedback.

"A quite radical improvement in my sleep. Most of my life I have struggled …I think the neurofeedback definitely had a role in it and my sleep is really good." (Mike)

The data suggests that overall stress management of participants improved following neurofeedback therapy. Some participants indicated they could manage previously

stressful situations more calmly, while others spoke of a noticeable reduction in anxiety levels.

"About two months, I would say into the sessions, where I said to my sister, you know what I think this is helping. Actually, I can tell you right now, my mother commented, she says, 'I see that you're much calmer in the car with me now.'" (Terry)

All participants indicated that the results of neurofeedback ultimately contributed to their confidence levels, which played an essential role in their mental well-being. Some participants who previously suffered from ADHD could now concentrate better, while others were more confident because they could control their emotions better during historically difficult situations.

"So, it's given me a sense of confidence that I didn't have before, but even in everyday life, I just feel like a more confident person, because I feel like I have more control of myself, and my brain and I don't feel like I'm going to have some sort of meltdown randomly." (Ren)

The cumulative positive impact of neurofeedback on various aspects of mental well-being has resulted in an improved day-to-day experience for participants. Previously complex tasks became more manageable.

"I've seen a massive shift in just my ability to initiate tasks, …Usually, things like that were very difficult for me... and I've noticed a big difference in being able to initiate not just one task a day, but multiple tasks throughout the day." (Ren)

Theme 2: Impact on the brain and healing

More than one participant likened the neurofeedback experience to going to the gym to exercise one's brain. Many participants spoke of how tired they felt following the first few sessions of neurofeedback and one participant used the analogy of how tired one felt after the gym. However, following regular sessions, they felt well and could see 'muscle' build-up.

"Something is happening in the brain and it's like going to the physio or the gym, the day after if it feels so painful and then you're like oh, this is nice and it shows you that change is happening, and you've got to give something a chance, I think." (Leia)

Some participants expressed being somewhat emotional and in touch with their feelings following neurofeedback; they recalled past events or felt very emotional but could not explain the feeling. There seemed to be a link to remembering and making sense of traumatic events. These events were sometimes related to childhood trauma, while others stem from the loss of a loved one and others from motor vehicle accidents, which left them unable to continue with specific tasks.

"I'm doing a lot of processing like healing. It feels like a lot of memories are coming up and cause mine's kind of trauma-related… I had too much trauma to process." (Jen)

Almost all the participants started neurofeedback following little or no success with traditional treatment methods such as medication or traditional 'talk' therapies. They felt that talking about their problems did not seem to help, but instead, the neurofeedback process allowed them to feel gradual shifts in how their brain was operating.

"I used to see a psychologist... I find it very intimidating to sit in front of somebody and talk about my problems…I always left feeling worse, so I stopped doing that, and I was just noticing such positive feedback… from the neurofeedback that I didn't feel like I wanted to do anything else." (Ren)

Some participants had fully weaned themselves off traditional medication, while others had the intention to wean, given the positive state of well-being they found themselves in following neurotherapy.

"Before neurofeedback, I was on a mood stabiliser called Epitec, and after neurofeedback, I decided to try and wean myself off some of my medication to see... So neurofeedback overall helped." (Ren)

Theme 3: Benefit to others

All participants expressed a desire to ensure that the benefits of neurofeedback should be shared with others. They felt that it was not a widely acknowledged therapy, and therefore, many people who could benefit were unaware of the therapy.

Every participant indicated they had either stumbled on neurofeedback while researching or through word-of-mouth. Given their positive experience, there was a strong sense that neurofeedback should be recognised and advertised widely to benefit everyone. There was a deep regret among participants that they had not discovered this therapy sooner.

"*I wish I would have known about this years ago. I've been on medication and seeing psychiatrists and psychologists since I was 15…I've heard about it for the first time when I was 29, and I've been seeing people for 15 years*." (Ren)

While all participants were pleased with the impact of neurofeedback on their well-being, they indicated that it would benefit a wider group of people. They indicated that frontline professional services should be educated to refer patients to neurofeedback.

"I think more GPs need to understand neurofeedback therapy … So, they should refer you. So, it's education." (Belle)

Neurofeedback requires multiple sessions and could thus be inaccessible due to affordability. All participants had a strong sense that medical aid companies should cover neurofeedback sessions, making them more accessible for well-being.

"I would say the only barrier to it is that it can be quite expensive." (Mike)

A large number of participants had tried various forms of treatment in an attempt to improve their well-being over numerous years. All expressed a desire to have found neurofeedback sooner, believing their lives would have been profoundly different.

"Without a doubt, I just wish I found it 20 years ago. I wonder how different my life would be… because I think I would have been far more high-performing than I am now." (Belle)

"I was diagnosed with ADHD when I was small and, had I started this when I was younger, I think it could have made an even bigger impact on my life, so I think that if there was more awareness around it and people knew that, for their children, there was an alternative to things like Ritalin and Concerta, and all those things that there is a more like, natural approach... I think it would be fantastic if people knew about it." (Ren)

None of the participants reported any negative experiences with neurofeedback therapy.

Discussion

This study aimed to understand, through participants' experiences, whether there is a perceived impact on well-being due to neurofeedback therapy.

The thematic analysis (Braun & Clarke, 2006) identified themes consistent across all participants relating to the positive impact of neurofeedback therapy, notably, the broad themes of the therapy being "life-changing", "having a positive impact on [their] mental health" and a strong belief that this therapy could "benefit others".

Almost all participants of this study indicated that they found neurofeedback therapy "life-changing" on multiple levels. The thematic analysis showed that participants felt that neurofeedback therapy had positively influenced their overall well-being. In line with previous research (Weber et al., 2020), brain activity changes, through neurofeedback, result in a positive change in cognitive functions, emotional regulation, and behaviours. The general timeframe for this change typically followed six neurofeedback sessions to feel a lifting of brain fog and general confidence improvement. A South African study (Oliveira et al., 2022) explored the impact of neurofeedback on wellbeing from a therapist's viewpoint with similar results. The therapist's perspective (Oliveira et al., 2022) and those relayed by the neurofeedback participants in this study are aligned, along with various studies which indicate

improvement in stress management and confidence levels (Askovic et al., 2023; Choi et al., 2023; Soleymani et al., 2021).

Multiple related studies have established the link between cognitive performance and mental well-being (Ali et al., 2013; Fuhrmann et al., 2022; Jokela, 2022). This study's findings are congruent with other studies (Matsuzaki et al., 2023) that show a strong correlation between improved cognition and the ability to perform tasks better, after neurofeedback therapy sessions. Further to enhanced cognition, neurofeedback has shown positive benefits in the treatment of mental disorders such as ADHD and, in some cases, has proven to be a more effective treatment than traditional medication (Duric et al., 2012). A similar impact was seen with depression and anxiety symptoms (Choi et al., 2023) and aligns with participants who shared strong views about neurofeedback being superior to traditional treatments such as medication or psychotherapy. Some participants even indicated that they were able to wean off medication following neurofeedback sessions.

Sleep is essential to well-being, improving mood, performance and overall health. Inadequate sleep can harm one's well-being, resulting in insomnia symptoms such as depression, anxiety and impaired functioning. The thematic analysis of this study is congruent with other studies in which neurofeedback is an effective treatment for insomnia (Hammer et al., 2011; Krepel et al., 2022). These studies confirm the profound life-changing impact of neurofeedback.

Neurofeedback has been likened to a high-technology training regime for the brain (Cohen, 2020), allowing the brain to learn and practice new behaviour patterns that provide for emotional regulation, mental stability, flexibility and resilience (Ros et al., 2014). It uses operant conditioning principles to trigger neuroplasticity to promote healing (Loriette et al., 2021; Kays et al., 2012; Ros et al., 2014). This is particularly significant in the treatment of PTSD and complex PTSD, which stems from long-standing trauma characterised by disrupted brain wave patterns. Studies have shown that rewiring brain patterns through neurofeedback can positively impact these deeply ingrained conditions (Askovic et al., 2023; Choi et al., 2023). This results in reconditioning brain activity and regulating a previously dysregulated brain.

Questions regarding the neurofeedback therapy process was not included in the interview, however the process is typically conducted in a standardised way across all practitioners. A noted limitation of this study is that only participants with positive experiences volunteered to participate; therefore, no negative experiences are depicted. Further, this study is limited to a small population derived from South Africa, which could imply that the responses are limited to the South African context. This study could be faulted for the biases associated with Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies. While the focus was not specifically on demographics, it is worth noting that the entire sample consisted of White, primarily English-speaking and predominantly female participants. This demographic could be indicative of perceptions related to the therapy or mental health within the South African context, the relative cost and accessibility of the

therapy, or pure coincidence. While it is acknowledged that the participants may potentially come from similar backgrounds, it can also be argued that one's perceptions and experiences of neurofeedback therapy can be generalised across populations to a large extent, given the very specific outcomes. Nonetheless, further studies across broader, diverse groups are suggested. The challenges of medical aid funding could be unique to the South African context and further research is suggested across a wider, global group.

Despite its history, dating to the early 1960s (Hammond, 2011), neurofeedback therapy remains largely unrecognised and inaccessible to most people. Neurotherapy is currently offered to veterans with PTSD in the United States (Van Der Kolk, 2014), but despite numerous studies highlighting its benefits (Askovic et al., 2023; Choi et al., 2023; Soleymani et al., 2021), neurofeedback lacks proper support from broader medical communities. This results in medical aid companies (insurance companies) and health systems denying funding for this treatment as it is not deemed mainstream healthcare. Considering the evidence, this therapy should be more accessible and recognised.

Conclusion

The thematic analysis outcomes validate that the experiences of these neurofeedback participants are congruent with the findings of previous neurofeedback research. The key themes are aligned with neurofeedback as a beneficial form of therapy for general well-being.

The therapy is widely recognised as “life changing” by participants, who feel a strong desire to ensure that these benefits are more widely shared. This study has highlighted a growing need to support neurofeedback in the pursuit of enhanced mental health interventions given the positive impact on mental well-being. There is a general lack of awareness of the benefits of this therapy, which reinforces the need for further education and marketing campaigns that highlight potential benefits both for service providers and the public. Education needs to extend to the healthcare sector, which, in turn, should be appropriately positioned to advise patients of alternative options for treatment. There is a need for further randomised controlled trials to support the efficacy of neurofeedback as a recognised treatment supported by the healthcare community. A key challenge remains the accessibility of this therapy, given that it is not recognised by medical aid funds; further research is recommended to improve accessibility through educational interventions.

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