Mental Health – Why so little progress?

A/Prof. Roger Gurr, December 2022

Mental health disorders represent a worldwide public health concern with high burden of disease. Medications and talking psychotherapies are recommended as evidence based first line treatments. However, evidence has recently been emerging that the efficacy of both types of treatment may have been over-estimated, due to several shortcomings of clinical trials, so it is important to get realistic estimates of efficacy.

After the benefits of new classes of medications from the 1950s onwards and evolving new psychotherapies, with the professional development of psychology, things seem to have stalled. In the last 30 years we got some marginally better anti-depressant and anti-schizophrenia medications, and some better talking therapies. But the more severe the disorder, the less the progress. A recent umbrella review and meta-analytic evaluation of recent meta-analyses of the efficacy of psychotherapies and pharmacotherapies for mental disorders in adults (Leichsenring et al, 2022) reported that across disorders and treatments, the majority of effect sizes for target symptoms were small. The effect size is a statistical calculation (Cohen's *d*) revealing the practical and clinical significance of a study result – the closer to 1.0 the better. For example, an effect size of 0.8 is good, 0.5 medium and 0.2 low. They found an effect size (standardized mean difference) of only 0.34 for psychotherapies and 0.36 for medications, compared to placebo or treatment as usual, and combined treatments compared with either monotherapy was only 0.31. They also noted that the risk of positive bias in studies was high. I have never seen an explanation as to why any particular therapy does not work for the target disorder!

After more than 50 years of research, thousands of randomized controlled trials and billions of invested funds around the world, the results are limited, suggesting we have hit a ceiling for standard treatment research. If we are to better help Australians suffering from disabling mental disorders, a paradigm shift is required to achieve further progress! What are we missing?

Is Developmental Trauma the missing factor?

The Adverse Childhood Experiences (ACE) studies (Centers for Disease Control & Prevention, USA) concluded that child maltreatment was the most costly public health issue in the United States, calculating that the overall costs exceeded those of cancer or heart disease, and that eradicating child abuse in America would reduce the overall rate of depression by more than half, alcoholism by two-thirds, and suicide, serious drug abuse, and domestic violence by three quarters. It would also have a significantly positive effect on workplace performance, and vastly decrease the need for incarceration. Around 17% of the population have 4 or more types of trauma, with very significant effects on mental and physical health, and if 6 or more, life expectancy is reduced by 20 years. Developmental trauma affects physical health as much as mental health, and negatively impacts brain functioning, becoming a major risk factor for many medical disorders (cancer, heart, liver, digestive, and respiratory diseases).

The Blue Knot Foundation with Pegasus Economics in 2015, calculated the cost of unresolved childhood trauma and abuse in 5 million adults in Australia would be as high as $24 billion. The NSW Government commissioned report in 2018 by Taylor Fry Actuaries, Forecasting Future Outcomes, which data matched 8 million data points in government controlled databases, showed that 7% of the NSW population would use 50% of the state resources by the age of 40. The identified vulnerable groups clearly suffer from developmental trauma. There are many other economic studies supporting the massive costs, not forgetting the associated personal, family and social pain.

Technology now allows dynamic evaluation of brain structures and function, including functional magnetic resonance imaging (fMRI) and quantitative electro-encephalography (qEEG). The evidence of the importance of the interactions between an individual's experiences of developmental (child and adolescent) trauma and their genes (and epigenetic factors) has become very clear, with a "dose" correlation of severity of trauma and severity of disorder, both mental and physical. Traumas include psychological and physical neglect, poor attachment, emotional abuse, physical and sexual abuse, vicarious trauma etc, and only a minority display PTSD symptoms.

A review by Teicher et al (2021) claimed that childhood maltreatment is the most important preventable risk factor for psychiatric disorders. Maltreated individuals typically develop psychiatric disorders at an earlier age, have a more pernicious course, more comorbidities, greater symptom severity, and respond less favourably to treatments, than non-maltreated individuals with the same primary DSM-5 diagnosis. Furthermore, maltreated individuals have alterations in stress-susceptible brain regions, hypothalamic-pituitary-adrenal response, and inflammatory marker levels, not discernible in their non-maltreated counterparts. Hence, maltreated and non-maltreated individuals with the same primary DSM-5 diagnoses appear to be clinically and neurobiologically distinct. Failure to address this distinction has interfered with our ability to identify the biological basis for major psychiatric disorders and discover novel treatments.

The first umbrella meta-analysis, published in October 2022 (Hogg et al), and using data from a large majority of childhood trauma studies, showed "that psychological trauma in childhood is associated with a nearly three times greater risk of having a mental disorder (OR = 2.92), and demonstrate that psychological trauma is a transdiagnostic risk factor for psychopathology.

A meta-analysis of executive functions in trauma-exposed youth (Op den Kelder et al 2018) showed that in the age range of 2-25, working memory, inhibition and cognitive flexibility were all significantly impaired, dose related to the severity of trauma. These impairments interfere with the efficacy of talking therapies and life performance.

These reactive brain changes are evolutionary protective mechanisms to enable survival in toxic environments, until at least puberty, and later adolescence, to produce the next generation. But the changes are hard to reverse without new ways to re-regulate brain functions, such as neurofeedback operant conditioning, which enables the brain to find its own solution, as each brain is unique.

As the interaction with the environment activates or supresses genetic and epigenetic expressions, thus altering hormones and production of biochemicals, it is most unlikely that medications will achieve the reverse of those genetic and epigenetic changes, and warm re-parenting and talking therapies are often insufficient as well. However structured biofeedback methods clearly can make the difference, as shown by objective pre and post measures. Ap person may still have a genetically determined disorder, such as schizophrenia, but they

Which end of the pyramid of need should we invest in – top or bottom?

Currently with the increased awareness of developmental and other traumas, the response of investing in trauma informed care is excellent. The funded services are mostly based on supportive relationships and talking psychotherapies, but with little evidence of effectiveness for the more severe, higher levels, of the pyramid. We have not seen a trickle up of new treatments! However, if we tackle the top of the pyramid and find effective treatments for them, then those treatments will almost certainly trickle down. Who wants to take this challenge?

Refugee Trauma treatment success

Since 2003, the NSW Service for the Treatment and Rehabilitation of Torture and Trauma Survivors (STARTTS) treating 7,500 traumatised refugees each year, found neurofeedback effective in addressing the most complex trauma cases. For example, a child soldier from Sudan would arrive in their teens and be expected to sit in a classroom, learn English and study for exams. They could not do it, and were at high risk of missing school, hanging out with other disaffected youth, abusing substances to feel better, and getting into trouble with the law due to anger. However, once given a course of neurofeedback sessions, they can become successful citizens, as their anxiety is reduced plus cognitive and executive function improvements. The performance benefits of neurofeedback are virtually permanent. STARTTS has also found that using quantitative electroencephalography (qEEG), as a measure of brain functioning, can help make decisions about effective treatment options and monitor the progress of treatment.

First Episode Psychosis example

At the headspace Early Psychosis Youth Service in Western Sydney, it was found that almost all the young people accepted into the program had experienced significant developmental trauma, and especially those with more severe symptoms. A small case series applying quantitative electroencephalography (qEEG) analysis and EEG neurofeedback has provided some excellent results, enabling reduced anxiety, depression, and substance use, plus increased social confidence, cognitive and executive functioning.

It was interesting that all the qEEGs recorded were abnormal, compared with a normative database, revealing evidence of disorders not otherwise found and indicating changes in medication. While medication may still be useful, they required lower doses and had fewer side effects. QEEG follow up showed objective evidence of improved brain function, compared to the normative database.

Two had severe schizophrenia, where treatment as usual (including clozapine medication), with the world best practice first episode of psychosis treatment program (Orygen Youth Health EPPIC model) had not been able to achieve these improvements in up to 4-5 years of care. However they both became much more functional with neurofeedback, with reduced anxiety, plus improved cognition and executive functioning. They both ceased using illicit drugs and the benefits of neurofeedback continued at a one year follow up of the person contactable.

Angelo Bolea, a psychologist working in a USA mental health hospital, was challenged to try neurofeedback with patients with deemed completely treatment resistant schizophrenia. He treated 70, who all improved and most left hospital with maintained benefits.

These examples illustrate that qEEG guided neurofeedback is able to calm the fear driven brain, the Default Mode brain network, always scanning for threats to survival. Once calmed, the Salience and Central Executive networks get a chance to operate more normally and so the person can take better advantage of the talking psychotherapies to further process the trauma.

Time to Act

Surely now is the time to invest in more pilot programs to progress the promising new means to assess the effects of developmental trauma and treat them. The opportunity costs of not doing so are enormous. The fourth generation of a male rat, given electric shocks while smelling roses, still reacted to the smell of roses, as if reliving the electric shock. Thus we need to prioritise treating

children and youth before they produce the next generation, while also treating the legacy adults. Following a controlled study applying neurofeedback to traumatised children, Prof Bessel van der Kolk is recommending neurofeedback facilities at every school.

The refugee and schizophrenia examples show that we should start with the most severely disordered, rather than the mild to moderate, as that is where we predict we will get the biggest dividends. First Nations people have had multiple generations of trauma and now we may be able to help close that health gap.

Expecting normal academic research processes to lead to implementation in practice will take a very long time, as the best models of care require teamwork, with many components of care (EPPIC model has 16 components of care and STARTTS similar), so any pilot service needs enough critical mass to efficiently treat a significant number of patients and enable good prospective research over several years.

The biggest limiting factor for treatment and research is the lack of suitably trained clinicians prepared to take on developmental trauma and learn the skills of QEEG and neurofeedback. Thus the starting point needs to be an investment in training provided by a consortium of specialist training organisations.

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