Formulation: A plea for parsimony

Dear Editor,

Formulation – a set of explanatory hypotheses that answer the question '*why does this patient suffer from this problem at this time*' – is considered an essential skill of a psychiatrist. The recent paper by Parker et al.[1] highlights the various approaches to formulation and distils several themes into a comprehensive approach. However, few authors have seriously considered the utility and reliability of psychiatric formulation.

A formulation may be said to possess utility if it provides useful information about prognosis and treatment outcomes or testable hypotheses.[2] This has never been demonstrated in a rigorous and prospective study of psychiatrists. Ridley et al. have outlined the manifold limitations of the utility of formulation, including its lack of precision and empirical inadequacies.[3] A formulation may be said to be reliable if common themes are identified by several psychiatrists independently assessing the same patient and blinded to other assessments. The reliability of formulation by psychiatrists has never been empirically demonstrated. A 2015 systematic review found studies of the reliability of formulation were mostly low quality and lacked fidelity to clinical practice.[4]

Why does all of this matter? Because the stories that psychiatrists tell patients about their illnesses can influence the course of their lives.[5] By influencing the perception of the causes of the patient's current problem or problems, shared psychiatric formulation may aid patient recovery but may also contribute to iatrogenic harm. There has been significant harm perpetuated by our profession, in part through ideological adherence to theoretical models that may have had face validity but have later been shown to be unscientific.[6]

Where to from here? Formulation should be approached with epistemic humility. While behavioural scientists have developed statistical models that can predict some human behaviour at an aggregate level with fair accuracy, there remains enormous uncertainty in explaining and predicting complex human behaviour at an individual level. In formulating, we should restrict ourselves to what is measurable and testable and utilise psychological theories that have survived replication. If hypotheses are proposed, these should be falsifiable. Finally, psychiatrists should continue to question the scientific foundations of clinical practice. It is advantageous for the profession and our patients to ask why we do what we do in our day-to-day work. The reply that it has always been done that way doesn't suffice.

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Author contributions

Dr Forbes conceptualised the idea and wrote the paper.

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Serotonin syndrome and cannabis: A case report

Dear Editor,

The increasing availability of cannabis administration devices (e.g. 'vapes' and 'dab pens') and medicinal cannabis with high Δ9-tetrahydrocannabinol (THC) concentrations may introduce novel complications of cannabis use. Cannabinoids predominantly act through the endogenous cannabinoid system, but animal studies suggest these compounds can also stimulate serotonin receptors.[1] This is in addition to CYP450 interactions altering the metabolism of serotonergic agents.[2] Recent cases from the United States suggest that high concentrate cannabis use can precipitate serotonin syndrome in patients taking antidepressants.[3–5] We report a case, with the informed consent of the patient, that suggests recurrent induction of serotonin syndrome requiring hospitalisation in the context of cannabis use.

A 20-year-old Asian man presented to the emergency department on three occasions via ambulance within 3 weeks with features consistent with serotonin syndrome, based on the Hunter Serotonin Toxicity Criteria (see Supplementary Table). He had an established diagnosis of bipolar disorder managed with fluoxetine 40 mg, melatonin 10 mg, and lithium (12 h-level ~0.7 mmol/L).

On Occasion 1, he presented with tonic-clonic seizures following a medication overdose (fluoxetine 560 mg, unknown quantity lithium). UDS was positive for THC. On Occasion 2, he presented with a GCS 10, febrile, tachycardic, hypertensive, restless and agitated. Examination revealed hyper reflexia, symmetrical ankle clonus and intermittent right calf clonus. An unremarkable outpatient assessment the previous day corroborated the acuity of onset. On recovery, he disclosed oral ingestion of cannabis oil (THC 28.5 mg/mL + cannabidiol <

1 mg/mL, unknown quantity) 1–2 hours before the episode. On Occasion 3, he presented as agitated, uncooperative and climbing off the bed. He was diaphoretic, GCS 13, tachycardic and hypertensive, and displayed horizontal jerky nystagmus, and had lower limb clonus and hyperreflexia. Collateral history suggested onset over <3 hours. Upon recovery, he disclosed using a THC 'vape pen' < 3 hours before the onset of altered consciousness. We acknowledge the limited information from patient records, including unquantified THC levels.

Cannabis products were present on all occasions where serotonin syndrome emerged. For Occasions 2 and 3, there was clear evidence that cannabis products were used immediately before the onset of symptoms. Given emerging evidence regarding the potential for cannabis to precipitate serotonin syndrome, a cannabis use history should be taken before prescription of serotonergic medications. Patients should be cautioned about the risks of co-administration of cannabis products.

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Informed consent

All identifying information has been removed/altered, and that written informed consent has been obtained from the patient for the material that is presented.

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Supplemental Material

Supplemental material for this article is available online.

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Response to 'Thinking clearly about climate change and mental health'

Dear Editor,

It is disappointing that *Australasian Psychiatry* has published an article by its deputy editor without disclosing any conflict of interest, particularly as the article insinuates biased presentation of evidence in the RANZCP statement on climate change.[1,2]

Amos' article examined two of the 35 publications referenced in the RANZCP position statement 'Mental health impacts of climate change' and concluded that they were inadequate to support the statement.[1] He noted that although 16 of 17 observational studies found positive relationships between higher temperatures and increased rates of suicide, observational research cannot prove that climate change increases suicide rates.[1] However, the studies clearly demonstrate trends and provide adequate evidence for Thompson et al to support the assertion that rates of suicide are likely to increase in line with climate projections. The most recent data reviewed by Thompson et al is from 2012, and climate change and understanding of its impacts have accelerated since then. There is growing knowledge of the sociological, biological and psychological mechanisms by which climate change increases suicides. Thompson et al propose that public health authorities account for higher temperatures when they update suicide prevention strategies.[3] Similarly, the RANZCP statement notes that suicide, the most common cause of death of young Australians, is increasing, and action is needed.[2]

Amos re-analysed data published by Burke et al that investigated associations between temperatures and suicide across the USA,[4] although they did not provide access to their statistical analysis.[1] Amos used whole states rather than suburbs, and years rather than months as units of analysis, and this aggregated data showed an inverse relationship between temperatures and suicide rates.[1] Aggregation masks the effects of extreme weather events that contribute to worsened health outcomes, and Amos' finding does not undermine the evidence that climate change is increasing suicide rates.[4]

Policy recommendations require critical analysis of evidence, and the RANZCP statement is based on peer-reviewed literature. Connections between climate change and mental health are complex, and on-going research is needed to understand causal relationships and reduce risk. However, the evidence is already sufficient for RANZCP to advocate for reducing its own contribution to climate change, and educating psychiatrists and the community.[2]

Besides increasing suicide rates, climate change may also increase anxiety, depression, post-traumatic stress disorder, substance misuse and other mental health disorders. Addressing climate