

Kaleidoscope

Derek K. Tracy, Dan W. Joyce,
Dawn N. Albertson, Sukhwinder S. Shergill

Although awareness of the impact of adverse childhood experiences (ACEs) on individuals has been growing, quantifying their broader societal costs has perhaps been more challenging.

Early life exposure to a range of significant trauma – from direct abuse, through neglect, to other forms of adversity – increases the likelihood of subsequent mental and physical illnesses, as well as social difficulties and harmful behaviours including school avoidance, smoking, drug consumption and juvenile offending. Previous work in the UK has shown that every additional ACE an individual has suffered leverages an approximate 10% penalty on their earnings and a 25% increased risk of welfare dependency and subjective poverty by retirement age. Hughes et al¹ examined the international literature, calculating country-level ACE prevalence, population attributable fractions (PAFs) due to ACEs and estimates of financial costs. The largest impact in most countries was from interpersonal violence (accounting for from 15–54%), followed by harmful alcohol use, illicit drug use and increased anxiety. In terms of finances, harmful alcohol use, smoking and cancer had the highest ACE-attributable costs in many countries, accounting in total for between 1.1 and 6% of gross domestic productivity (with a median value of 2.6%). These non-communicable diseases produced greater financial strains, despite their lower PAFs, owing to their higher population burden. The impact of ACEs on individuals will be something familiar to most clinicians; the costs to nations have been under-researched. ACEs are not inevitable and with resource can be minimised. As well as the essential support that would provide to many individuals at risk, these data give succour to the argument that we literally cannot afford not to invest in prevention and better early life care.

As the Christmas period fades from memory, alcohol reduction might feel pertinent for some of us. There is only limited information on harm minimisation in adolescents.

This is a problematic gap for a period when first consumption is most common, and you might be surprised to learn that alcohol accounts for almost one-sixth of illness burden in young adults. Newton et al² report on a randomised controlled trial that clustered over 2000 students (mean age 13 years) by school into four groups: universal web-based prevention; targeted work on high-risk students; combined universal and targeted work; and a control condition of health education as normal. ‘High risk’ was determined by personality profile, with other work showing this is a greater predictor of binge drinking than, for example, more general genetic factors. The targeted intervention looked to understand and modify personality-specific reactions and behaviours, while the more general programme challenged social norms and built refusal skills. As well as encompassing a relatively large number of students, importantly, the work included follow-up over 7 years. All three interventions reduced overall harm compared with the control, and the universal and targeted groups also demonstrated lower patterns of hazardous consumption (more than five ‘standard drinks’ in a single day). Interestingly, the combined intervention provided no additional gains, which the authors suggest might be due to confusing or overwhelming the subgroup of higher-risk students who received both. Further analysis of their data also suggests that benefits particularly accrue through intervention in middle adolescence, around age 16. These data are helpful in showing that interventions in young people can produce long-lasting gains into early adulthood, and that both universal and targeted approaches have merit.

#FakeNews: how good, or bad, is media reporting of the range of therapy available for the management of depression?

It’s been shown that psychiatry gets – literally – bad press compared with other medical specialties, so what about our treatments? Pathak et al³ evaluated media coverage of antidepressants and psychotherapies from 2013 to 2018; 221 online articles were reviewed from the *Sun*, *Daily Mirror*, *Daily Mail*, *Daily Express*, and *Guardian*. Antidepressants received more coverage, which was typically worse, with medications portrayed negatively in 37% of articles and positively in only 15% (contrasting with 2% negative and 36% positive for other therapies). One of the more egregious headlines the authors highlight was ‘Mother says antidepressant drugs turned her son into a “psychotic killer”’. It might not shock you to learn that the *Daily Mail* ran the greatest number of negative stories on medication, but the *Daily Mirror* had an even worse percentage of these, so both sides of the political spectrum were covered. The *Guardian* had the highest percentage of positive portrayal, but one might argue it doesn’t have the reach of the tabloids. The real challenge is trying to understand how this affects perceptions of mental illness, stigma and help-seeking. For many, depression is characterised by lower self-esteem and self-worth. An obvious concern is that the negative press coverage will put people off seeking or taking evidence-based interventions, as well as increasing a sense of shame in those who do. As the *Sun* infamously once said – Gotcha. This needs to improve and better follow the scientific evidence.

Problematically, it’s a man’s world when it comes to medication guidelines.

Brand et al⁴ counter with an expert review on antipsychotic medication for women with schizophrenia spectrum disorders. They rebut the standard teaching that female outcomes in psychosis are better, identifying more recent data showing similar numbers of lifetime readmissions, recovery rates and longer-term functional outcomes. Women typically have slower drug absorption, metabolism and excretion, meaning that ‘standard’ doses lead to higher plasma levels, risking greater side-effects. Compounding this, oestrogens enhance dopamine sensitivity, meaning that with antipsychotics, even ‘equal’ serum levels will produce greater dopamine occupancy in women. However, treatment protocols very seldom account for this, and all are based on a literature dominated by studies on male patients. This physiological double-hit means, the authors state, that ‘women are likely to be overmedicated by default’. Times when sex hormones are higher, such as ovulation and gestation, may further amplify overmedication, whereas conversely, dosing might need to be increased during menstruation and menopause. The review calls for clinicians to be mindful that some symptoms from antipsychotics – notably hyperprolactinaemia, which can cause oestrogen deficiency – can be particularly problematic for women. For post-menopausal women, who are liable to be more sensitive to medication side-effects yet need higher antipsychotic doses, oestrogen replacement therapy is a potential mitigating intervention. We suspect that few clinicians consider this in practice or would have the confidence or appropriate supports to instigate such prescribing. The paper highlights multiple gaps in knowledge and practice; we can only agree with the authors’ call for women-specific medication guidelines. We think they’ve also exposed an important gap in clinical services that could be rectified locally with some thought.

Perhaps gender bias in medication guidelines just reflects that in medicine more generally, where women hold more junior positions and receive less pay.

Across medical specialties, women make up between 14% and 46% of the workforce, with the highest proportion found in general practice and medical education and the lowest in surgery and emergency medicine, and psychiatry sitting roughly in the middle. There’s much conversation about

readdressing this 'leaky pipeline', but it's rarely acknowledged that the number of women in a field influences the value that field appears to have. Analysis of 30 years of US doctoral degrees has shown that once a field reached a quarter female, male PhD applicants plummet. Light and colleagues⁵ explored the connection between 'feminisation' of a 'STEM' discipline and its perception. They found that artificially inflating the numbers of women noted in a field led participants to increasingly label it as a 'soft science'. Similarly, 'soft sciences' were expected to contain larger numbers of women, despite the field (social science versus engineering/physical science) indicating that the labelling was independent of the nature of the work itself. This effect was associated with stereotypes of women as being less capable in STEM disciplines, rather than an association of women with softness or a perceived idea about women's interest in science careers. The bias behind the labelling of female-dominated STEM areas as 'soft science' matters because of the consequences of such a label. Participants ranked 'hard sciences' as being significantly more difficult, reliable and prestigious. This effect was most pronounced in men, who devalued 'soft sciences' more than women, though both ranked 'hard sciences' equally. Importantly, when participants were asked to allocate funding, the majority was given to 'hard sciences'. While much can be done within education and workplaces to help bolster the number of women in scientific and medical fields, their progress will inevitably be stymied if their mere presence devalues the perceived desirability of the subject and risks dragging down available funding and success to those who persist. Change greater than just increased representation is necessary.

Physicist Niels Bohr wrote 'Those who are not shocked when they first come across quantum theory cannot possibly have understood it'. Psychology – according to DeBrouwere and Rosseel⁶ – has a kind of 'physics envy', using theoretical and experimental sophistry often alongside mathematical formalisations to explain human minds and behaviour. Rather than representing rigour, this has proceeded without attaching theories to reality (by avoiding messy field research), instead confining itself to controlled experiments that are barely recognisable approximations and using 'statistics to whitewash uncertainty'. The problem is one of making a prediction and demonstrating a compatible result that appears unlikely (or counter-intuitive) and for which you have a candidate theory that wraps it all up. This hypothetico-deductive approach is necessary for the natural sciences but insufficient for the social sciences where, instead, more emphasis needs to be placed on cataloguing experimental observations (the inductive approach) to arrive at conclusions. Psychology's small experiments emphasise statistical significance and consequently we expect to find small effect sizes, hence the reliance on 'accept/reject' null-hypothesis tests. This reflects the idea that subtle effect sizes would be larger (and more impressive) if only we possessed larger samples that would 'drown out' the noise in the experiment, a demonstrably false proposition. Theory in natural sciences must make predictions about a spectrum of phenomena and survive a number of experiments. By contrast, in psychology, the aim to only reject a precise and quantified null hypothesis allows us to essentially ignore the universe of hypotheses generated by alternative theories. In short, the theory does not generalise or predict in the same way that a theory (and the consequent array of candidate experiments) might do in the natural sciences.

DeBrouwere and Rosseel cite the now-debunked Rosenhan experiment, Zimbardo's social psychology of conformity and Wansink's nutrition experiments, pointing to the familiar reproducibility crisis as evidence of this drive for 'cunning' yet failed experimentation. They deconstruct the infamous 'invisible gorilla' experiment (where participants watch a video, with the instruction to count the number of times players in white tops pass a basketball, with the surprise being that around half of participants fail to see the

person in a gorilla suit walking slowly through the scene) as nothing more than proof that humans selectively attend when given an instruction to do so. They conclude that psychology needs many proposals for stricter discipline (e.g. higher thresholds for declaring statistical significance, pre-registration and replication studies), but ultimately the aspiration of the 'cunning, confirmatory and conclusive experiment of hypothetico-deductive science' is the rate-limiting step in progress to a robust psychological science.

Finally, the word 'lunacy' comes from the longstanding folk association between the moon's phases and mental illness; but that's just myth, right? Writing in *Molecular Psychiatry*, Meyer-Rochow et al⁷ report the distribution of Finnish suicide data from 1988 to 2011, explored through lunar phase (new moon <25% visible, full moon >75% visible and times in-between) and season. No associations were seen for men, but in women there was a significant correlation ($p = 0.001$) for the winter season and, for those under the age of 45, the presence of a full moon. What on earth – or beyond – could account for this? There is no clear answer: the authors put forth the darkness of the Finnish winter, greater rates of seasonal affective disorder and depression in premenopausal women, a putative impact of lunar periodicity on menstrual cycles and – perhaps most speculatively – 'cosmogeophysical effects on the autonomous nervous system'. The last of these feels a bit too close to astrology for us, perhaps fitting with the earlier piece on design in psychology studies, and a response from Plöderl and Hengartner challenges the authors.⁸ They note that in general, a low prior probability of a true association – which would seem to be the case here – increases false positive rates beyond 50%. This, they argue, is amplified by splitting samples into subgroups that were not defined in a pre-specified initial study protocol, which they propose is because no one would have ever pre-registered a study with such a hypothesis. To give the final word to the authors, they replied to the critique with examples of how lunar phases have been demonstrated to affect multiple behaviours in other animals. They conclude by invoking the 'Semelweis reflex': the well-documented reluctance of scientists to accept findings that appear outside the Pale – the discovery that stomach ulcers were caused by bacterial infection being the most well-known example.

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