

# PSYCHOLOGY MISCELLANY

No.211 - Mid-December 2024

Health Things

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ISSN: 1754-2200

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A complete listing of his writings at <http://psychologywritings.synthasite.com/>. See also material at <https://archive.org/details/orsett-psych>.

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# **1. THE SOCIAL AND MENTAL HEALTH**

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## **1.1. INTRODUCTION**

The “social” in relation to mental health is conceptualised in different ways “across academic disciplines, health and welfare services, community organisations, and patient advocacy and user led groups” (Bemme and Behague 2024 p403). For example, theories include the “social determinants of health” (table 1.1) (appendix 1A), the “social model of disability”, and “social capital” “to name just a few” (Bemme and Behague 2024 p403).

Bemme and Behague (2024) commented: “The bulk of research on the social dimension of mental health, whether epidemiological, sociological, or anthropological, has tended to focus more on describing and explaining social and structural harms than on intervening to modify harmful structures and social processes. Put simply, root causes are well known: researchers are often better at diagnosing social harms, exemplifying them through narratives of suffering or statistics, than figuring out how to change them” (p405). These authors introduced a special issue of the journal “Social Psychiatry and Psychiatric Epidemiology” which explored the concept of “social” and mental health in different situations.

They wanted the articles to “demonstrate how theorising the social across disciplinary and experiential domains has the potential to improve our understandings of how mental health unfolds in complex social worlds. More importantly, adopting inclusive approaches to theory development considerably widens the

- A variation on the social determinants of health is “Latin American social medicine” (LASM) (or “collective medicine”), which focuses on “the ‘processes of determination’ that produce health and illness, such as wealth accumulation, reproduction of social hierarchies, and the political systems that justify late capitalism” (Behague et al 2024 p524).
- A manifestation of this idea is “socially sensitive psychotherapy” (or “socially attuned therapy”) which emphasises “agency, sociality and politics” (Behague et al 2024 p524).
- Behague et al (2024) used examples from the “1982 Pelotas Birth Cohort” in Southern Brazil (n = 5914 at birth). “Most young people living in situations of precarity experienced therapy, particularly when based in schools, to be a blame-inducing process. A more fulfilling and impactful therapeutic experience took shape when young people were able to shift the focus away from symptom reduction and behavioural management toward narrative life analyses, social debate, and political agency. Use of socially sensitive therapy was statistically associated with increased political participation and reporting of discrimination after controlling for confounders. The empowering effects of therapy were greater for those with less formal education and family income, but not for young people who identified as black, brown, or non-white” (Behague et al 2024 p523). It should be noted that socially sensitive psychotherapy was “not common or mainstream” (Behague et al 2024 p532).

Table 1.1 - Latin American Social Medicine.

purview of what needs changing: not only mental health outcomes or their immediate social risk factors but also the multi-faceted social worlds that shape these, as well as the modes of knowledge production about both” (Bemme and Behague 2024 pp406-407). However, the authors admitted a lack of diversity in terms of articles by individuals with lived experience.

The “social” is often divided into different types, including relational, structural, economic, and political dimensions, but Burgess (2024) argued against “the fragmentation of the social” (p411). She explained: “Scholars in the social sciences, particularly quantitative social sciences, typically negotiate within the space of the social by breaking it into constituent parts through the creation of typologies. The aim of typologies is to divide, and the division is felt to enable analytic tasks and refining of concepts, as well as the creation of categories for measurement, classification, and sorting of cases” (Burgess 2024 p411).

However, this process leads to “often underacknowledged hierarchisation” or value around the categories” (Burgess 2024 p411). In other words, some dimensions are seen as more important or “better” than others. The answer for Burgess (2024) is to hold “the complexity presented by the totality of social life as it potentially relates to mental health” (p409). This is closer to the lived experience of individuals with mental health problems. Meanwhile, Carroll (2014) made this distinction: “While the African world view prioritises an interconnected and interrelated reality that relies upon the immaterial aspects of reality to make sense of the lived experience and favours relations of the whole, the European worldview prioritises the separation of social reality, only utilising that which can be apprehended with the five senses to validate and provide meaning for that which we engage through our lived experience” (quoted in Burgess 2024) <sup>1</sup>.

Kirmayer (2024) argued for a “cultural-ecosocial systems approach” (eg: Gomez-Carrillo and Kirmayer 2023) for three reasons: “(i) it emphasises the dependence of human biology and psychology on participation in socially constructed niches and larger systems; (ii) it acknowledges the importance of social structural determinants of mental health in accounting not only for the unequal distribution of mental health problems in populations but also as contributors to the basic mechanisms of psychopathology and hence, to their causes, course, and response to interventions; and (iii) it insists that the effects of social structure are mediated and maintained by cultural meanings and practices” (p567). This approach sees the individual as embedded in a social environment imbued with cultural meaning.

Kirmayer et al (2024) used the example of Indigenous peoples in Canada, who “have experienced a long history of domination and marginalisation following from settler colonialism and deliberate policies of cultural oppression and forced assimilation. This has been described in terms of the metaphor of ‘historical trauma’, which draws attention to this history and its transmission across generations. The transgenerational transmission of trauma occurs at multiple levels of organisation: through child-rearing practices, family

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<sup>1</sup> The United Nations noted in 2020 about the global mental health response: “Not focused on how poverty and social injustice can produce mental distress. The focus has been on the burden and cost of mental health disorders. That is not consistent with a human rights-based approach and has been shown to be methodologically flawed. The focus remains on individual rather than systemic change as a means of tackling poverty and oppression” (quoted in Burgess 2024).

dynamics, community cohesion and collective identity. The narrative of historical trauma feeds back into these material and social-interactional consequences of colonialism to alter how people think about themselves and the kinds of responses they (and others) have to their symptoms and suffering. The historical trauma narrative then not only points to a diverse set of social and psychological determinants of distress, it adds its own mechanism through the impact of attributional and interpretive processes on meanings of identity, community and self-understanding. Any attempt to study this transgenerational transmission must consider the ways in which structural inequities, violence, everyday discrimination, and collective identity are embodied and enacted" (pp568-569).

## **2.2. DIAGNOSTIC CRITERIA**

The importance of the social is not seen in official psychiatric diagnosis criteria for mental disorders like the "Diagnostic and Statistical Manual of Mental Disorders (5th ed)" (DSM-5) (APA 2013), which focuses "mainly on the dysfunctions of the individual" (Zagarío and Zennaro 2024 p475).

Zagarío and Zennaro (2024) performed a textual analysis of 192 selected DSM-5 categories of mental disorders using "social" criteria (eg: "affiliation and attachment"). Less than 20% of the categories mentioned such terms, including "culture", but most categories did include a "clinical significance criterion": "the disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning" (APA 2013 quoted in Zagarío and Zennaro 2024).

The researchers concluded: "The overall results suggest that DSM criteria offer a confused account of social" (Zagarío and Zennaro 2024 p475).

## **1.3. DISABILITY BENEFITS**

Mental health problems are perceived differently to physical health ones, particularly in relation to claiming welfare benefits for the inability to work. In the UK individuals since 2008 undergo a "Work Capability Assessment" (WCA) around their health-related functional impairment and seeking work. Irvine and Haggar (2024) explored this system with particular reference to mental

health, "specifically a biomedical conceptualisation of mental illness or condition as a discrete agent", which "presents obstacles to (i) accurately understanding a claimant's lived experience of distress (ii) meaningfully establishing the specific ways it affects their capacity for work, and (iii) identifying the multifaceted range of barriers (and related support needs) that a person may have in relation to moving into employment" (p455).

The WCA divides individuals into three groups - "fit for work, limited capability for work, and limited capability for work and work-related activity. As the names suggest, these groupings have different degrees of requirement for active jobsearch and work preparation. People in the fit for work and limited capability for work groups are required to undertake jobsearch and/or other 'work-related activities', as agreed with their Work Coach, and face the risk of sanctions (financial deductions) from their benefits if they fail to do so. Claimants in the limited capability for work and work-related activity group are not expected to seek work nor to prepare for work in the future" (Irvine and Hagggar 2024 p456).

The classification system criteria, however, are based on functional impairments which favour physical health conditions, it is argued, and are "widely perceived as inadequate in their ability to reflect and evaluate the impact of mental ill health on a person's capacity to find and sustain employment" (Irvine and Hagggar 2024 p457). "Failing" the WCA can make an individual feel that their suffering is not believed to be real, as an interviewee of Irvine et al (2023 quoted in Irvine and Hagggar 2024) described: "What you're saying is, if I don't qualify, I don't have a mental illness. That's what you're saying really: that I'm well... And I think that really upsets people, because to actually say to somebody, 'You're not poorly', when they're dealing on a daily struggle with whatever they're dealing with, that's really offensive..." (quoted in Irvine and Hagggar 2024).

Irvine and Hagggar (2024) criticised the individual-based focus of a "mental health condition" as viewed by the WCA, and the decontextualising from the social situation <sup>2</sup>. These authors described show this in three

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<sup>2</sup> Bister (2024) observed: "During my ethnographic research on knowledge practices in German psychiatric hospitals and the mental healthcare sector, I noted that, to resume everyday life and to plan healthcare interventions, clients and staff often referred to social conditions. Family status, employment, housing, asylum status, education, age, or gender featured prominently as aspects of what was considered the 'social'. It struck me that these references allowed for two contradictory conclusions: mental health afflictions were considered to be embedded in a larger social context, but, at Psychology Miscellany No. 211; Mid-December 2024; ISSN: 1754-2200; Kevin Brewer



challenges faced by welfare benefit claimants:

i) "Entification of 'mental illness' as a discrete agent" - "The first challenge stems from treating mental health problems as discrete entities, separate from their functional effects. Brinkmann [2016] (citing Valsiner [2007]) writes of the 'entification' of mental health problems, ie: treating a psychological 'condition' as an independent explanatory agent: 'Entification involves transforming a trait, temperament, emotion or some other psychological phenomenon into a 'thing', typically with causal powers to affect action'" (Irvine and Hagggar 2024 p458).

Put simply, the dominance of the biomedical conceptualisation of mental illness/mental health problems. Rose (2018) pointed out that the social contexts of mental distress "are not external to the disorder... They are constitutive of the complaint" (quoted in Irvine and Hagggar 2024) <sup>3</sup>.

ii) "Decontextualisation from specific work environments" - The WCA focuses on "fit for work" as a general concept rather than understanding the individual's problems in relation to specific work environments.

"The fact that many people sustain paid work alongside mental health problems indicates that mental health is often not the determining factor in whether someone is able to work or not; workplace and personal relationships, caring responsibilities, physical health, education, skills, finances, housing, as well as local labour markets and employment security, all influence the sustainability of employment alongside mental health problems" (Irvine and Hagggar 2024 p458).

iii) "Isolation of mental health from wider contextual barriers to work" - Irvine and Hagggar (2024) noted that "people claiming out-of-work benefits frequently experience a multitude of interwoven challenges that may include: insecure housing, lone parenthood, caring responsibilities, domestic violence,

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the same time, the person afflicted seemed to remain responsible for coping individually with this broader context in their own lives, albeit with the support of the welfare state" (p467).

<sup>3</sup> Talking about older adults and retirement, Glaser et al (2024) commented on the "social context" in terms of "linked lives" (Settersten et al 2020) - ie: "that individual experiences occur within, and are heavily conditioned by, interdependent social relationships" (p565). They explained further that "social relationships with family members, as well as across work and family life domains (the work-family interface), and with social entities (working conditions and welfare systems) are likely to influence work transitions, and in turn these social contexts can act to modify the impact of work on mental well-being" (Glaser et al 2024 p565).

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offending, substance use, debt, low literacy, lack of qualifications, limited work experience, rural isolation, limited local employment options, the compounding effects of long-term unemployment on confidence and self-esteem, as well as physical and/or mental health problems. All these factors are influential in a person's cognitive and practical capacity to seek, secure and sustain paid employment" (p459). So, poor mental health can "a compounding problem" rather than "the primary problem" (McManus et al 2012 quoted in Irvine and Hagggar 2024).

"Health-related eligibility criteria may drive people to project and internalise a 'sick role' [Parsons 1951] as the only viable means of legitimising and securing welfare status. Thus, the mentally ill identity may become a welfare-based 'survival strategy' [Hansen et al 2014) which then inhibits effective steps towards employment. A medicalised framing that rests on entification and foregrounding of psychological impairment thus diverts attention away from a focus on capability and possibility, and may therefore become obstructive at a practical level in assisting people to identify and address the range of work-related support needs and to explore types of occupation that may be feasible and fulfilling alongside and in spite of any ongoing and fluctuating experiences of distress" (Irvine and Hagggar 2024 p460).

Bister (2024) reported a case in Germany of "Ms.Reisch", a woman in her early 50s whose child had to be placed in temporary foster care during her psychiatric in-patient period. The social welfare categories in which she was placed shaped her experiences. Three categories were noted by Bister (2024):

- a) "Mentally ill" (a psychiatric diagnosis).
- b) "Severe disablement" (in order to receive sickness benefits, and with no savings she was dependent on State support).
- c) "Single parent" (thus the need of placing her twelve year-old in temporary foster care).

Bister (2024) argued that the different categories worked against each other, particularly in relation to her individual recovery and her being a parent. Put simply, as a welfare claimant she was compelled to do certain things (eg: go to rehabilitation), which

conflicted with her life as a parent (ie: who to care for the child during that time). This led to the temporary foster care and the negative consequences on her mental health. The resolution was finding friends who provided the child care and so rehabilitation was attended. For Ms.Reisch a post-categorical approach would have been better was Bister's (2024) conclusion.

#### **1.4. HELP-SEEKING**

The decision to seek professional help for mental health problems is often viewed as a one-off individual decision. Green and Pescosolido (2024) used the idea of the "Network Episode Model" to contextualise the decision, that is "tracing the entire set of actions, from discussion with family and friends to consultation with lay advisors to entering the healthcare system, [and] shifts the focus to patterns or pathways to care" (p432). Data were taken from the "Indiana University Person-to-Person Health Interview Study" (P2P) (nearly 2700 Indiana State residents interviewed in 2018-20 and post covid in 2020-21) (appendix 1B). Four hundred individuals who self-reported mental health or emotional problems in the past year were the focus of Green and Pescosolido's (2024) analysis.

Five pathways to care for mental health and emotional problems were distinguished:

i) "Networked, General Care" (37% of respondents) - Spoke to family and friends, and visited general health care provider.

ii) "Networked Multi-Sector Care" (32.5%) - Spoke to family and friends, and accessed both general and specialist health care.

iii) "Kin General Care" (14.5%) - All spoke to relatives, but few sought professional help.

iv) "Saturated Path" (12.8%) - Made use of many different sources of help.

v) "Null Path" (3.3%) - Spoke to no-one.

The researchers saw the findings as attempting to highlight "the social" in relation to mental health, in this case social networks and help-seeking. The size of the social network, and the strength of the ties

influenced professional help-seeking. "While those with strong ties are likely to seek care of some sort, having larger networks translates into accessing a richer set of options. Cultural beliefs in those networks matter to some extent, since networks with strong trust in doctors are associated with pathways that access the general and specialty medical sectors. Individuals from the majority white population, and those with higher levels of education, report pathways to the specialty sector, signalling a continued disparity" (Green and Pescosolido 2024 p438).

### **1.5. PRACTITIONERS**

Among practitioners are community health workers (CHW), who around the world provide local support and care. Their duties cover mental health as well as the more common maternal and child health. How is the "social" practised by CHW?

Jain et al (2024) studied CHW in Dehradun, Uttarakhand, India. Forty-six were interviewed about their "people with psycho-social disability" (PPSD) in 2017. This is the preferred term for individuals who self-identify as experiencing mental health distress, and who were registered in the care of a non-profit community health partnership project ("Burans", which began in 2014 in the area around Dehradun). "Common mental disorder" is the biomedical term used to cover conditions like anxiety and depression. The CHW provided psycho-social support.

The researchers explained: "Community workers in our sample displayed a high degree of knowledge of the context of their client's lives and were able to apply this in developing their responses. This included knowledge across a number of domains including both of more intimate spaces, like family dynamics, as well as wider forces such as environmental and social determinants. The knowledge of the context and structural health determinant was described as implicit ('I just know') and linked to their own experiences of living in communities that were socio-economically similar" (Jain et al 2024 p497).

So, the two key elements of the work of the CHW with the PPSD were their relationship, and the implicit understanding of the social and structural determinants of mental health. The latter was seen in support of families and communities for access to clean drinking water and sanitation, or in finding ways to earn money, for instance.

## **1.6. GLOBAL MENTAL HEALTH**

"Global mental health" (GMH) is an interdisciplinary field that promotes evidence-based mental care, particularly in low- and middle-income countries (Bemme et al 2024).

Bemme et al (2024) explained: "Since the inception of the field [in early 21st century], the locus of knowledge and power in global mental health has been under scrutiny guided by the question 'Whose knowledge counts?' in the production of evidence. Despite the goal to develop effective treatments and mental health policies in diverse settings, the field's priorities, concepts, and outcomes have remained skewed towards the epistemic rules of academia, reflecting its origins as an academic enterprise. While the evidence-based approach has many benefits, the research designs favoured by clinicians and epidemiologists may have inadvertently silenced other forms of expertise. Community mental health practitioners, people with lived experience of mental health problems, civil society members, and social scientists are uniquely attuned to the complexities, needs, and challenges in their specific settings" (p546).

One solution is "mutuality", where individuals from different parts of the world, and different areas of research and practice share knowledge equally. "Mutuality as a method treats the outcomes and processes of knowledge production as intertwined. Only when all participants can equally contribute, feel heard, make decisions, and determine priorities together can a transformative epistemic space emerge" (Bemme et al 2024 p550).

Bemme et al (2024) offered some suggestions for mutual learning to succeed, including involving diverse collaborators, and the process of unlearning for some (ie: "of views and prejudices shaped by coloniality, class, gender, and location"; p551).

## **1.7. SOCIAL INCLUSION**

"Social inclusion" is advocated as positive for mental health as social exclusion is a negative experience. "Social inclusion for people living with mental illness is advocated to reduce stigma and discrimination and remove social and structural barriers to full participation in society. Yet, there is a lack of clarity around what is meant by 'social inclusion'. Concepts often focus on the physical environment and

functional abilities, whilst excluding social and political dimensions. Only limited consideration has been given to the meanings of social inclusion within different socio-cultural settings and the ways in which it is envisioned, negotiated, and practised in the day-to-day experience of people living with mental illness and their families” (Read et al 2024 p504).

Read et al (2024) explored this issue with a critical eye. For instance, “for people experiencing severe mental illness ‘inclusion’ in the community may also increase exposure to ridicule, abuse, and discrimination. For example, whilst the ‘extended family’ is often presumed to be the ideal environment to protect against such exposure and provide care and support, it is seldom acknowledged that families can also be sites of conflict, tension, and strain” (Read et al 2024 p504). Social inclusion can assume conformity to the norms and values of the community.

Read et al (2024) reported a five-year ethnographic study in Ghana, and the West Bank of the occupied Palestinian territory, which included participant observation, and semi-structured interviews.

Though the community was viewed as positive in some ways, it was also experienced as harmful or even dangerous by people living with mental illness, who “described being exposed to hostility, humiliation, and, sometimes, abuse, including being mocked, ridiculed, and labelled as ‘mad’. People would stare at them, avoid them, talk about them behind their backs, and exclude them from common courtesies such as greetings. To fit in, many felt that they had to hide feelings and experiences that could single them out as being different. As a young Ghanaian woman in Accra explained: ‘belonging to a community first you have to conform and some of us do not want to conform’” (Read et al 2024 p507).

Care (and social inclusion) as “complicated” (Toews 2004) was also experienced within the family. For example, exclusion from family events was common, as a Ghanaian mother of a daughter with mental illness explained: “They say this sickness is a spiritual sickness, so when she goes the evil spirit can let something happen. So when someone dies and the person has such an illness we don’t let them go [to the funeral] until the corpse has been buried” (p507).

## **1.8. INTERSECTIONALITY**

Health inequalities, for instance, are often

understood in terms of broad social categories like gender, race/ethnicity, and socio-economic position /status/class, "with the social forces driving these inequalities often being underacknowledged. This can contribute to the perpetuation of deficit-based or damage-centred perspectives which locate the 'problem' of inequality within the group(s) being examined rather than the underlying structures and processes, which serve as the up-stream, fundamental causes of such inequalities. Similarly, the complexity of personal experience, in that people occupy more than one social identity/ position which can include a mix of advantaged and disadvantaged identities/positions that are dynamic and context-dependent, gets frequently under-recognised" (Moreno-Agostino et al 2024 pp417-418).

This can be resolved by the use of "intersectionality theory", which sees social identities as "interdependent and mutually constitutive rather than independent and uni-dimensional" (Blowleg 2008 quoted in Moreno-Agostino et al 2024).

Applying these ideas to an analysis of data on mental health during the covid-19 pandemic in the UK, Moreno-Agostino et al (2024) found a greater impact based on the additive effects of social categories, with particular reference to sexual orientation (eg: sexual minority South Asian men in their thirties from a disadvantaged childhood social class suffering more than the "average"). The data came from two British cohorts born in 1990 ("Next Steps") and 2000-2002 ("Millennium Cohort Study") interviewed via telephone in early 2021 (n = 8588).

### **1.9. COMMUNITY-BASED PARTICIPATORY RESEARCH AND SOCIAL CAPITAL**

"Community-based participatory research" (CBPR) describes a variety of methods that both study and empower communities, particularly disadvantaged ones. "CBPR initiatives are often used to empower or share power with equity-deserving communities. It is a process that can create bridges between communities and researchers through the process of sharing knowledge and experiences, ultimately benefiting everyone involved. Engaging in CBPR can blur lines and relationships between researchers and communities, which can have implications for research ethics and appropriate safeguards. For example, researchers strive to publish results, but there are ethical implications of disseminating results when it

could be damaging to the community. Difficulties balancing community values with individual ones, as well as negotiating power dynamics and relationships can also become ethical concerns" (Ehsan 2024 p515).

Empowerment is not inevitable. Ehsan (2024) reported sadly: "I learned that depending on who funds, leads, and can access CBPR, CBPR can also be used as a tool that upholds dominant power structures and can oppress marginalised peoples" (p520).

One area for CBPR relates to "social capital". This is "an umbrella term referring to the variety of social resources that are embedded within social relationships, though there are multiple definitions, applications, and understandings of the term" (Ehsan 2024 p516). Simplistically, it can be seen as the number of social relationships, and it is "a known determinant of mental health" (Ehsan 2024 p516). In Switzerland, for example, since 2002, CBPR interventions have been implemented in communities "with the initial goal of integrating older adults in their neighbourhoods, developing solidarity and connectedness with one another, and improving their overall quality of life" (Ehsan 2024 p516).

Ehsan (2024) reported her involvement with one such intervention that found that "social capital had increased for the intervention participants, but importantly, that those who participated in the intervention already had higher amounts of social capital to begin with. In the rest of the community, social capital had declined that year" (p519). She stated: "I observed the 'dark side' of social capital [eg: Villalonga-Olives and Kawachi 2017], or when social relationships that are beneficial to some are detrimental to others, and when individuals do not have enough social capital to get involved" (Ehsan 2024 p516).

### **1.10. SUICIDE PREVENTION**

Cero et al (2024) observed: "The structure of relationships in a social network affects the suicide risk of the people embedded within it. Although current interventions often modify the social perceptions (eg: perceived support and sense of belonging) for people at elevated risk, few seek to directly modify the structure of their surrounding social networks" (p555). This is the pattern of relationships (or structure) in a social network.

Research has shown that individuals with high suicide risk tend to cluster together in social networks



(known as assortativity or assortative clustering). The upshot is that "people with elevated risk may unconsciously influence their friends toward similarity, the new friendships they do form will tend to be with other at-risk people, and they occupy environments that are more likely to prompt everyone toward elevated risk. Conversely, the opposite is true for their healthier peers, who are influenced toward greater health by their already healthy friends, the people they form new friendships with will tend to be healthy, and they disproportionately occupy healthier environments" (Cero et al 2024 p557).

Another finding from research is that high suicide risk individuals are less integrated into broader social networks (ie: a tendency toward isolation) (Cero et al 2024).

The conclusion from these points for suicide prevention is to alter the structure of social networks (Cero et al 2024).

### **1.11. APPENDIX 1A - SOCIAL DETERMINANTS OF HEALTH**

The "social" was important in the mid-20th century as an explanation of mental distress, according to Horwitz and Grob (2011), but this was replaced by biological causes with the advent of DSM-III (APA 1980). In the 21st century, however, the "social determinants of mental health" has emerged as important (Birk and Manning 2024).

This idea is attributed to Allen et al (2014), who defined social determinants as "the conditions in which people are born, live, work, and age, and the health systems they can access, which are in turn shaped by a wider set of forces: economics, social, environmental policies, and politics" (quoted in Birk and Manning 2024). Birk and Manning (2024) commented: "The social determinants of mental health, in short, are the conditions of people's lives, which again are shaped by social and societal circumstances. The social, here, begets the social and is implicated in mental health. It is not our intention here to quibble over words. Rather, we want to point to what seems like a significant lack of reflection about what, exactly, the social is" (p538).

Brossard et al (2020) surveyed 289 research articles that linked mental health and the "social", and found that "the concept of the social here was used in rather uneven ways. For example, they found that the word social referred both to a person's social position, their

feelings (eg: 'social stress'), their 'skills to function in everyday life', the environment of the person (eg: family), and many others, with the most common meaning of the social – for Brossard and colleagues – actually being 'unclear'" (Birk and Manning 2024 p538).

Birk and Manning (2024) distinguished three "classic" ways of viewing the social:

a) The social as structure ("Social I") - "structures" in society that impact the individual (eg: poverty).

b) The social as individual ("Social II") - the individual experience of "structures" (eg: the impact of the experience of poverty on mental health).

c) The social as relational ("Social III") - interactions and processes between individuals (eg: poverty as relational - ie: "largely from the solutions that elite and non-elite actors improvise in the face of recurrent organisational problems –challenges centring around control over symbolic, positional, or emotional resources"; Emirbayer 1997 quoted in Birk and Manning 2024).

One idea of the "social" being applied to mental health, and coming originally from animal studies, is "social defeat". "Social defeat, the experience of being excluded from a majority group, is associated with increased rates of psychiatric symptoms including anxiety [...] and psychotic symptoms [...]. Environmental stressors such as racism, discrimination [...] bullying [...] and childhood adversity [...] can result in the experience of social defeat. It has been proposed that the social defeat resulting from these chronic social stressors might lead to an increased risk for the development of psychotic disorders" (Lincoln et al 2022 quoted in Birk and Manning 2024). The "imprecise definitions" of concepts, however, have been criticised (Birk and Manning 2024).

## **1.12. APPENDIX 1B - WHO HAS MENTAL HEALTH PROBLEMS?**

Pescosolido and Green (2024) used P2P data to understand three perspectives on mental health problems - the self (ie: the subjective assessment), the social network (ie: views of friends and family members), and the psychiatric profession (ie: a computerised screening

system: "CAT-MH™").

There was general agreement among the three perspectives on the majority of individuals (around two-thirds of the sample) (labelled as the "Well"), and around 8% labelled as the "Sick" (who were more likely to be younger, female, people of colour, and have lower educational qualifications than the average). With the remainder of the sample (around one-quarter) there was disagreement, leading to six groupings (table 1.2).

GROUPING	SELF	SOCIAL NETWORK	CAT-MH
"Unmet Needers"	No	No	YES
"Self Deniers"	No	YES	YES
"Network Deniers"	YES	No	YES
"Worried Well"	YES	No	No
"Network Coerced"	No	YES	No
"Prodormal"	YES	YES	No

(Yes = viewed as having mental health problems; No = no such problems)

Table 1.2 - Disagreement over the three perspectives (Pescosolido and Green 2024).

The "Unmet Needers" was the largest of these groups. "Here, diagnostic criteria suggest need but neither individuals nor their networks agree. From a psychiatric perspective, programmes of individual and community-based education continue to be necessary for such individuals to receive care. However, in absence of 'signs' of mental illness (eg: blood tests) and none on the horizon, overdiagnosis, over-medication, and stigma may result if the individual and social network perspectives better map the situation here" (Pescosolido and Green 2024 pp449-450).

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## **2. VIRTUAL REALITY RELAXATION**

- 2.1. Mental health service workers
- 2.2. General population
- 2.3. References

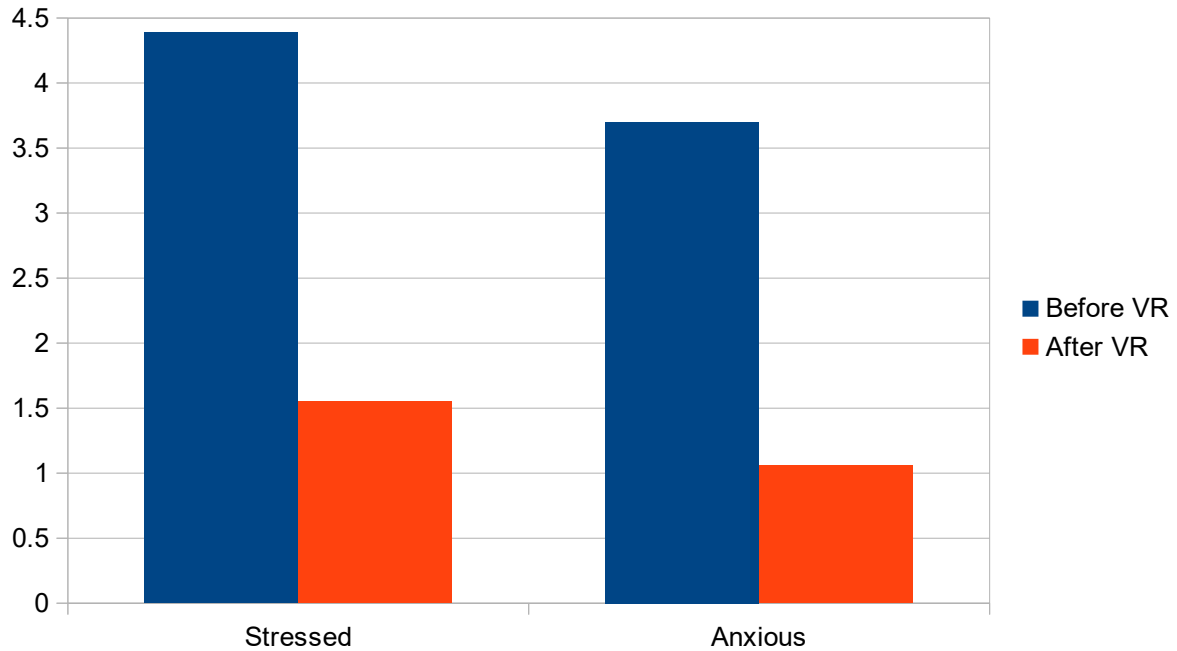
### **2.1. MENTAL HEATH SERVICE WORKERS**

“Virtual reality (VR) relaxation” is a stress-reduction technique introduced in recent years. It uses “a head-mounted display and audio-visual stimulation to immerse users in 360-degree relaxing natural virtual environments, such as swimming with dolphins, mountains, coral reefs, guided meditation on the beach, and other gamified elements, with the aim of promoting relaxation and reducing stress and anxiety... VR relaxation is less cognitively taxing and may offer potential benefits over other relaxation techniques such as mindfulness, due to the immersive elements and positive imagery, which can increase engagement and help overcome distraction...” (Williams et al 2024 p2).

A single session of up to one hour was found to benefit staff working in mental health services in South London by Williams et al (2024). Twenty-two staff volunteers completed measures before and after the VR session. Participants had a choice of VR environments including scuba diving with dolphins, mountains, and a quiet beach.

“Post-VR, for the total sample, there were significant increases in relaxation, happiness, connectedness to nature (all large effects), and decreases in stress (figure 2.1), anxiety (both large effects) and sadness (medium effect)” (Williams et al 2024 p3).

This was a feasibility study, so participant feedback was collected. “Participants found the VR ‘relaxing’ and ‘calming’, and a ‘reflective space’, which had ‘a positive impact on future approaches to their well-being’. Participants found the VR to be an ‘immersive’ and ‘positive distraction from work’. For a minority of participants, the VR induced ‘sleepiness’ and there was some ‘discomfort in underwater environments’. Some participants made practical recommendations for the future implementation of VR relaxation, including increased comfort, mobility, interactivity, and choice of virtual environments” (Williams et al 2024 p4).



(Data from table 2 Williams et al 2024)

Figure 2.1 - Mean response to "how stressed you feel right now" and "how anxious you feel right now" (out of 10, where 10 = very and 0 = not at all).

There are a number of key issues with the use of VR relaxation, including:

i) How many sessions and/or how long for each session?

ii) The user's ability to immerse themselves in the VR environment, including due to outside noise and distractions.

iii) The ability to use the equipment and the programme.

iv) The choice of VR environments and personal preference.

## 2.2. GENERAL POPULATION

Riches et al (2021) undertook a systematic review of studies of VR relaxation use generally. Nineteen relevant studies, published between 2007 and 2020, were found, of which thirteen were controlled studies. Six of the



studies were rated "strong" in terms of methodological quality, and six as "weak". "Studies predominantly used natural audio-visual stimuli to promote relaxation. Findings indicate feasibility, acceptability, and short-term effectiveness of VR to increase relaxation and reduce stress" (Riches et al 2021 p1707).

In the controlled studies, relaxation scores were significantly higher after VR relaxation than in control groups.

Table 2.1 lists the key methodological issues and differences between the studies.

- Sample - mostly young adults and/or students.
- Number of sessions of VR relaxation.
- Length of follow-up after treatment - eg: 2 weeks; 3 months.
- Definition of relaxation and measurement of outcomes - Riches et al (2021) explained: "The current review identifies a lack of consistency and standardisation of definitions, measures, and interventions of relaxation across the studies reviewed. Although some studies stated relaxation as a primary outcome measure, definitions of relaxation were varied, with some inconsistencies, and there were no formal, validated measures of relaxation. Instead, studies employed physical parameters, idiosyncratic self-report measures, or psychometrics of relaxation-related variables. Single items on perceived relaxation were sometimes included in self-report measures; however, there was no stand-alone measure of relaxation" (pp1724-1725).
- Form of VR relaxation - eg: snowy Christmas-themed; natural environments; 2D graphics; make of head-set.
- Control of confounding variables.

Table 2.1 - Key methodological differences between the studies.

In terms of VR relaxation for general workplace stress management, Riches et al (2024) reviewed the evidence on VR and immersive technologies (eg: multi-sensory rooms). Seventeen studies published between 2011 and 2021 were found. The methodological quality of the majority of the studies was rated "moderate".

Generally, the studies showed that well-being and relaxation were improved and work-related stress was reduced.

The studies varied in terms of methodological

issues, including the sample, the number of sessions, and the outcome measures in particular.

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### **3. BURNOUT AND PSYCHOLOGICAL THERAPISTS**

"Burnout" (first introduced by Freudenberger 1974) describes "a process of physical and emotional exhaustion, fatigue, detachment and self-doubt that people who work in caring and supporting roles can experience" (Vivolo et al 2024 p1). Maslach (1982) developed the concept with emphasis on depersonalisation, emotional exhaustion, and a lack of sense of personal accomplishment.

Studies have found the prevalence of burnout in up to half of medical professionals, and as many as two-thirds of psychologists and therapists, depending on the definitions and measures used (Vivolo et al 2024).

Psychological therapists have a risk of burnout because of their work, and Vivolo et al (2024) reviewed the experiences through nine qualitative studies found. "Therapists reported a number of physical, emotional and psychological difficulties associated with burnout, which significantly affected their lives. Therapists talked about feeling fatigued and struggling to focus at work, describing a sense of 'being there but not being there' (Clarke et al 2021). The emotional impact of these difficulties was evidenced by the participants' experiences of feeling numb and demotivated. Similarly, their professional efficacy and emotional availability were also affected. As a result, therapists reported experiencing decreased personal accomplishment, which led to being unable to work" (Vivolo et al 2024 p4). Table 3.1 gives examples of quotes from the studies.

Participants in the studies also identified systemic and organisational challenges that contributed to burnout, particularly as these things were perceived as "something they have little or no control over, which fuels their sense of powerlessness and hopelessness. Some of these organisational difficulties seemed to foster the awareness of clashing values, with related ethical implications. Therapists experience ethical dilemmas stemming from dealing with systemic issues they do not feel in control of, which can increase the sense of responsibility they carry" (Vivolo et al 2024 p10).

All nine studies in the review used qualitative methods, and included volunteers sampled by purposive or snowball recruitment techniques. Overall, methodological quality was rated as good. "The main limitations included risk of recruitment and selection bias, transparency and credibility issues due to lack of reporting on data saturation and reflexivity, and reduced transferability

STUDY	QUOTE
Norrman Harling et al (2020)	"I was sitting in my car after an intense week, where I've done lots of travel and done things in other places, in my job. And afterwards, I had to stop the car and sort of let it spin for a while, and get out. And I got so scared, I thought 'Dammit! My brain is whacked now'".
Hammond et al (2018)	"One of the main things I remember is driving to work... just wishing I felt sick that day or, you know, that I get a flat tyre or something just so I didn't have to go".
Clarke et al (2021)	"I'm just like a zombie at the end of the day... And then kind of having that blunt, you know, when other people tell you stuff, you're just kind of like 'I wanna have that emotion, and I wanna show you that, but I've literally got nothing left in the tank', '... And so it feels like the, the, the more, um... infinite some of those levels [of empathy] are in the room, in therapy, then the more finite they become out there in personal relationships".

Table 3.1 - Three examples of therapists' descriptions of burnout experiences quoted by Vivolo et al (2024).

due to the qualitative methodologies and small sample sizes used" (Vivolo et al 2024 p1).

One further issue was the definition of "psychological therapist", which covered "a number of professionals, including different kinds of psychologists and psychotherapists, but excluded other professionals, such as sport psychologists, counsellors, trainees, and students" (Vivolo et al 2024 p11).

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## **4. KETAMINE USE IN THE UK MOSTLY**

- 4.1. Overview
- 4.2. Appendix 4A - Global drug survey
- 4.3. References

### **4.1. OVERVIEW**

Since the covid-19 pandemic, overall drug taking has dropped by 13%, while the number of adults using ketamine (table 4.1) has increased by 31% between 2019 and 2023 In England, according to official figures. The UK Home Office estimated around 300 000 adults had taken ketamine in 2022-23 (Steafel 2024) (table 4.2) (appendix 4A).

- Chemical name: 2(2-chlorophenyl)-2-(methylamine) cyclohexanone.
- Brain chemistry: non-competitive glutamate N-methyl-d-aspartate (NMDA) receptor antagonist.
- Effects: anaesthetic, but also analgesic.
- Desired effects for recreational users: eg: hallucinations; out of body experience; timelessness; weightlessness; euphoria; enhancing the effect of other drugs.
- Unwanted effects for recreational users: eg: confusion; impaired memory; fear of "K-hole" (out of body experience); coming down; anxiety and paranoia.
- Polysubstance use common (ie: used in conjunction with other substances).

(Source: Corkery et al 2021)

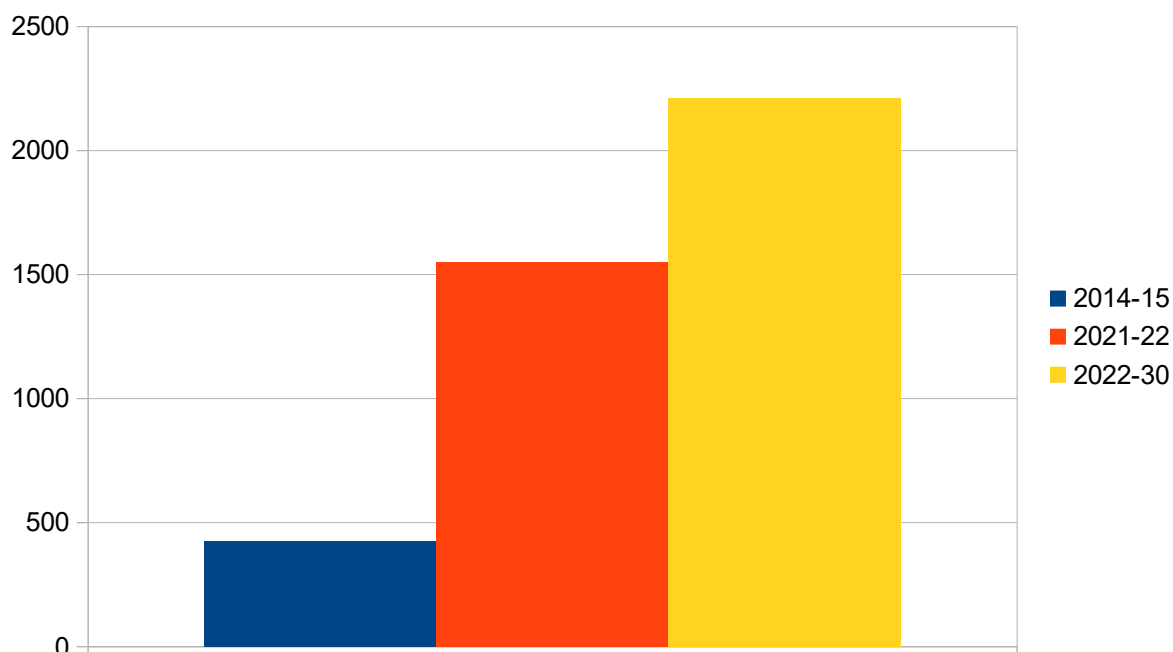
Table 4.1 - General information about ketamine.

Treatment for ketamine-related health issues has increased from 1388 adults pre-covid to 3041 in 2022-23 in England, based on official data (Steafel 2024), as well as those starting substance misuse treatment (figure 4.1).

Large-scale ketamine use for recreational purposes is relatively new, so there is "very little research" on its impact, and the definition of ketamine addiction is "still not completely clear to everyone" (Dr Irene Guerrini, specialist ketamine clinician, quoted in Steafel 2024).

STUDY	DETAILS	COMMENT
McCambridge et al (2007)	Lifetime prevalence (ie: ever used) 25.5% in 1999 and 39.8% in 2003; current use (eg: last month) 3.9% in 1999 and 16% in 2003	Sample recruited via "Mixmag" (music magazine aimed at clubbers); young adults
Flatley (2019)	Use in last year: 0.3% of 16-59 year-olds in 2006-7 and 0.8% in 2018-19	Crime Survey of England and Wales (CSEW)
NHS Digital (2019 quoted in Corkery et al 2021)	Use in last year: 1% of 11-15 year-olds in 2018	"Smoking, Drinking and Drug Use among Young People in England" survey

Table 4.2 - Three studies of prevalence of UK recreational use.



(Source: Office for Health Improvement and Disparities: <https://www.gov.uk/government/statistics/substance-misuse-treatment-for-adults-statistics-2022-to-2023/adult-substance-misuse-treatment-statistics-2022-to-2023-report>; accessed 11th November 2024)

Figure 4.1 - Number of adults starting substance misuse treatment in England for ketamine in three years.

Ketamine has been cheaper to purchase "on the street" in the UK than other recreational drugs, and the

online price has dropped drastically in 2023 and 2024 (Steafel 2024). Josh Torrance (drug researcher at the University of Bristol) stated: "'I've never really seen a drug market do that. There's always quite a lot of volatility and fluctuation, but to have the bulk price of a drug quartered essentially over that period of time is nuts'. With the oversupply comes 'increased prevalence and increased use'. 'You can easily buy a gram for £10 at the minute, as opposed to £25-30 before'. A lot of dealers will have a 'minimum purchase amount'. 'They don't want to come all the way to your front door for a tenner... And that might push them to have a purchase minimum of say 2-3g" (quoted in Steafel 2024 p21).

Deaths arising from the recreational use of ketamine is an increasing issue. Corkery et al (2021) addressed this with data from the "National Programme on Substance Abuse Deaths" (NPSAD) database in England. Approximately 80% of coroners reported to NPSAD since 1997. The criteria for the NPSAD database are one of the the following: one or more psychoactive substances directly implicated in the death; a history of drug dependence or abuse by the case; and the presence of controlled drugs in the body at post-mortem. The period of 1997 to 2019 was the focus of Corkery et al (2021).

Initially, less than five deaths per year (between 1997 to 2005), which rose to thirty per annum by the end of the study period. the cases were predominately males, mean age in early 30s, and having a history of drug use. Accidental poisoning was the main cause of death. Table 4.3 lists three comparable studies of ketamine-related deaths from around the world.

STUDY	FINDING
Gill & Stajic (2000)	87 deaths in New York City 1997-1999
San Nicolas and Lemos (2015 quoted in Corkery et al 2021)	25 cases in San Francisco 1997-2003
Darke et al (2020)	68 deaths in Australia 2000-2019

Table 4.3 - Three studies of ketamine-related deaths outside the UK.

Strous et al (2022) found that long-term recreational ketamine use was associated with negative changes in the brain (eg: lower grey matter volume; lower



cortical connectivity). The differences, compared to controls, were in both the structure and the function of the brain, and "may explain some of the long-term cognitive and psychiatric side effects, such as memory impairment and executive functioning" (Strous et al 2022 p1). The researchers explained further: "Many of the observed changes were correlated with the amount and duration of ketamine consumption, suggesting a possible dose dependent effect of prolonged ketamine on brain structure and function" (Strous et al 2022 p13).

These conclusions were based on a review of sixteen studies. Long-term ketamine use was defined as a minimum duration of more than fourteen days. In total there were 440 ketamine users (mean of 2-10 years of use, and 2.4 g per day) (compared to 259 drug-free controls and 44 polydrug controls). Strous et al (2022) noted that five of the studies were based on the same sample. The studies of structural differences used neuroimaging technology, like magnetic resonance imaging (MRI) scans, while the studies of functional brain differences used psychological and cognitive tests (eg: memory test; depression scale).

The studies did not have baseline (pre-ketamine use) measures of the brain, and depended on self-reported ketamine use. The researchers admitted: "we do not precisely know what dose of ketamine they used, which type of ketamine (racemic or esketamine) and whether they consumed pure ketamine or ketamine contaminated with other substances" (Strous et al 2022 p14). There were uncontrolled potential confounders, particularly that ketamine users were more likely to be polydrug users, including tobacco. Some studies had polydrug users as controls, others did not make this distinction. "Therefore, the observed brain changes cannot indisputably be ascribed to ketamine alone. In addition, street ketamine might not be pure ketamine but could be contaminated with other drugs, which would strengthen this confounding. Also, ketamine abuse itself might give rise to abuse of other substances" (Strous et al 2022 p15).

Strous et al (2022) also noted that "most of the included subjects were of Asian ethnicity, which might have influenced outcomes for instance through genetic differences in drug metabolism. However, it has been shown that frequencies of cytochrome P450 variants responsible for ketamine metabolism do not vary significantly between people with Asian or Caucasian ancestry" (p15).

## 4.2. APPENDIX 4A - GLOBAL DRUG SURVEY

Studying illicit drug use is not straightforward, and a number of methods can be employed (table 4.4). The "Global Drug Survey" (GDS) is one way. This is an anonymous online survey promoted on social media, online drug forums, and "partner organisations", and is aimed at individuals 16 years and above who have used at least one drug in the past year.

- Self-reports of use (with general or specialist population samples).
- Those who seek treatment for (i) addiction/abuse, and/or (ii) physical health problems/emergency medical treatment.
- Post-mortem.
- Wastewater analysis - eg: 100 European cities in 2022 (European Monitoring Centre for Drugs and Drug Addiction 2022 quoted in Barrios et al 2024).

Table 4.4 - Different ways to study illicit drug use.

Barrios et al (2024) performed a secondary analysis of data from the GDS 2018 (data collected between November 2017 and January 2018). Secondary analysis means that the researchers did not collect the data, but use those produced by others. It is dependent on the original data collection method (eg: questions asked; sampling).

Barrios et al (2024) concentrated on the ketamine data. The total sample of GDS 2018 was 130 761 (from ten main countries), and 5.93% reported having ever used ketamine (N = 7759). Of those 7759 respondents, 57.70% had used it in the past year (N = 4477).

In terms of the characteristics of ever used, the majority were males in their 20s<sup>4</sup>, White, and self-identified as heterosexual. Distinguishing past-year users from not used recently, the former were slightly younger, more likely to be gay men, students, and have polydrug use. The researchers noted the health risks of polydrug use, and also "chemsex" (drug-taking and sexual behaviour, often condomless).

In terms of methodological evaluation of the GDS, two key points to note:

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<sup>4</sup> The recreational use of ketamine predominately by young males has been reported in various studies around the world, including Spain, China, Taiwan, and the USA (Barrios et al 2024). Psychology Miscellany No. 211; Mid-December 2024; ISSN: 1754-2200; Kevin Brewer

i) Non-probabilistic sampling - Recruitment from those taking drugs ("hard-to-reach population"), but depends on individuals seeing the online advertisements, and then volunteering to participate ("volunteer bias". It is an international study, but nearly half of the ketamine respondents came from three countries (Germany, England and Denmark).

ii) Data - Self-reported with no way to verify as anonymous ("self-report bias"). Thus, depends on the accuracy of responses (eg: recall ("recall bias"); honesty ("social desirability bias")). There is also the "honest liar", where respondents give what they believe to be a true answer, but the information is false (eg: amount of ketamine used when another substance had been substituted). For example, an Australian analysis of 33 samples of ketamine found that nearly half were other substances (Olsen et al 2022 quoted in Barrios et al 2024). On the other hand, other studies had found a "high fidelity" between self-reports and chemically confirmed substances (Barrios et al 2024).

The study is a cross-sectional design (ie: one point in time), as opposed to the longitudinal method that collects data multiple times from the same individuals, and causation cannot be established.

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## **5. TWO STUDIES USING UK BIOBANK DATA**

- 5.1. UK Biobank
- 5.2. Cardio-respiratory fitness and dementia
- 5.3. Timing of physical activity and colorectal cancer risk
- 5.4. Appendix 5A - UK Biobank sample
- 5.5. References

### **5.1. UK BIOBANK**

The "UK Biobank" began in 2006-2010 with around half a million 37-73 years-old UK residents. There were 22 assessment centres involved in England, Wales and Scotland, and 9.2 million individuals within 25 miles of the centres were invited to join the study, with 503 317 consenting to participate (a response rate of 5.45%; Fry et al 2017).

The age range chosen was "a pragmatic compromise between participants being old enough for there to be sufficient incident health outcomes during the early years of follow-up and young enough for the initial assessment to occur before incipient disease had a material impact on exposures" (Sudlow et al 2015 p2).

Various measures were taken at baseline, including physical and functional measures, self-reported health information, and blood, urine, and saliva collection (Sudlow et al 2015) (table 5.1).

Sudlow et al (2015) outlined the general rationale for the UK Biobank thus: "The challenge of understanding the determinants of common life-threatening and disabling conditions is substantial. These conditions are typically caused by a combination of lifestyle, environmental, and genomic factors, with individually modest effects and complex interactions, the detection and quantification of which require studies with large numbers of disease cases. While retrospective case-control studies of particular diseases or existing prospective studies of particular risk factors can help to address this challenge, a complementary approach is to establish large prospective cohorts designed to study a much wider range of known and novel risk factors for a wide range of diseases" (p1).

Questionnaire and interview	
Sociodemographic	Social class; ethnicity; employment status; marital status; education; income; car ownership
Family history and early life exposures	Family history of major diseases; birth weight; breast feeding; maternal smoking; childhood body size; residence at birth
Psychosocial factors	Neurosis; depression (including bi-polar spectrum disorder); social support
Environmental factors	Current address; current (or last) occupation; domestic heating and cooking fuel; housing; means of travel; shift work; mobile phone use; sun exposure
Lifestyle	Smoking; alcohol consumption; physical activity; diet; sleep
Health status	Medical history; medications; disability; hearing; sight; sexual and reproductive history
Hearing threshold	Speech reception threshold*
Cognitive function	Pairs matching; reaction time; prospective memory*; fluid intelligence*; numeric memory†
Physical measures	
Blood pressure and heart rate	two automated measures, one minute apart
Grip strength	Left- and right-hand grip strength
Anthropometrics	Standing and sitting height; weight and bio-impedance; hip and waist circumference
Spirometry	Up to three measures
Bone density‡	Calcaneal ultrasound
Arterial stiffness¶	Pulse wave velocity
Eye examination§	Refractive index, intraocular pressure; acuity; retinal photograph; optical coherence tomography
Fitness test§	Cycle ergometry with electrocardiogram (ECG) heart rate monitoring

\* assessed in 170,000 participants;

† assessed in 50,000 participants;

‡ measured in one heel for 170,000 participants and in both heels for 320,000 participants;

¶ measured in 170,000 participants;

§ measured in 100,000 participants

doi:10.1371/journal.pmed.1001779.t002

(Source: Sudlow et al 2015 table 2)

Table 5.1 - Measures taken at baseline.

## 5.2. CARDIO-RESPIRATORY FITNESS AND DEMENTIA

“Cardio-respiratory fitness” (CRF) is the “capacity of the circulatory and respiratory systems to supply oxygen to skeletal muscle mitochondria in order to meet the energy demands of physical activity. CRF declines over the life course, and the rate of decline accelerates with advancing age, from -3% to -6% per decade in the 20s and 30s to over -20% per decade in the 70s and beyond. This is mainly driven by declines in skeletal muscle metabolism and function in older age” (Wang et al 2024 p1).

Low CRF is associated with cardiovascular events, and mortality, and possibly reduced cognitive functioning. “To date, most studies investigating the CRF-cognition association have been characterised by relatively small sample sizes, limited populations, and inconsistent findings” (Wang et al 2024 p1).

Some studies have found that high CRF is associated with better attention, executive function, and visual memory in older adults, for example (Wang et al 2024). One problem is the measurement of CRF in older adults. Psychology Miscellany No. 211; Mid-December 2024; ISSN: 1754-2200; Kevin Brewer

"Maximal exercise testing is considered to be the most accurate measurement of CRF. However, it requires participants to exercise to exhaustion and therefore can only be performed in relatively healthy populations, with obvious selection biases and lack of generalisability. The sub-maximal test, which estimates CRF from the relationship between the incremental heart rate response and work rate, is safer, relatively less expensive, and simpler to perform than maximal exercise testing, and therefore is more appropriate for estimating CRF in large epidemiological studies" (Wang et al 2024 p1). Another issue is the age group studied (eg: 55-65 years; older).

So, the specific dementia risk and CRF has not been established, and this was the motivation of Wang et al's (2024) using the UK Biobank data. CRF was measured at baseline with a six-minute sub-maximal exercise bike test, and individuals were categorised as low, moderate or high CRF based on age and sex. Diagnosis of dementia was taken from medical records.

Complete relevant data were available for 61 214 participants who were dementia-free at baseline. Over the follow-up period (on average eleven years), 553 individuals developed diagnosed dementia. The high CRF group was significantly less likely to develop dementia than the low CRF group - a reduced risk calculated at one-third, controlling for genetic risk of Alzheimer's Disease. The high CRF group also had better cognitive performance at baseline. "Compared with those with moderate or high CRF, participants with low CRF were more likely to be older, non-white, have a lower socio-economic status and education level, have a higher BMI [body mass index], abstain from smoking and alcohol drinking, have lower levels of physical activity and social activity, have a higher prevalence of diabetes, hypertension, cardiovascular disease, and dyslipidaemia..." Wang et al 2024 p3).

The researchers offered two possible biological mechanisms for the findings. "First, CRF represents the function of the cardiovascular system, respiratory system, and skeletal muscle metabolism, and is an objective reflection of the overall health status. Previous studies have related cardiovascular disease, low pulmonary function, and sarcopenia to dementia risk. Therefore, CRF could serve as an indicator of dementia risk" (Wang et al 2024 p7). Second, low CRF leads to reduced cerebral blood flow and this is linked to the development of dementia in some way.

Evaluation of Wang et al (2024):

i) Sub-maximal exercise measure of CRF, which “requires less physical exertion and therefore it can be more feasible to implement in older adults from the community” (Wang et al 2024 p7) (+). But this measure may be “less accurate” than the maximal test (Wang et al 2024) (-).

CRF was measured at baseline only. Thus, “the association of CRF change and dementia risk could not be examined” (Wang et al 2024 p7) (-).

ii) A longitudinal study, which allowed the measurement of CRF before the development of dementia, and this is suggestive of causation (certainly more than with the cross-sectional design) (+).

iii) All types of dementia included (taken from medical records and based on standard diagnostic criteria; eg: ICD-10 codes <sup>5</sup>) (+). But missed dementia cases not reported or detected by doctors (-).

iv) Calculation of polygenic risk score for Alzheimer’s Disease from genetic analysis of baseline blood sample (+).

v) Detailed information on lifestyle and medical history taken at baseline (+). But unmeasured potential confounders and measurement errors (eg: smoking self-reported) (-). Also the change in such behaviours not covered (-).

vi) The UK Biobank sample is volunteers, who are “generally healthier and more socio-economically advantaged than the general population in the UK. In addition, to guarantee the safety of the participants, individuals with certain health conditions (such as chest pain at rest, high weight, high blood pressure, pacemaker etc) were excluded from the sub-maximal exercise, making this study population ‘healthier’ than the rest of the UK Biobank participants” (Wang et al 2024 p7) (-).

vii) Very small number of cases of some of the dementia types (eg: vascular dementia), and this limited sub-type analysis (-).

viii) The categories of low, moderate and high CRF were defined to give approximate thirds of the sample (-).

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<sup>5</sup> World Health Organisation’s (WHO) “International Classification of Diseases” (10th ed) (ICD-10). Psychology Miscellany No. 211; Mid-December 2024; ISSN: 1754-2200; Kevin Brewer



### 5.3. TIMING OF PHYSICAL ACTIVITY AND COLORECTAL CANCER RISK

Less physical activity (PA) overall is associated with greater disease risk, but the timing of exercise during the day may also be relevant. For example, mid-day or afternoon PA has been associated with lower blood glucose levels, while evening activity is linked to lower body mass index (Stein et al 2024).

What about the relationship between the diurnal timing of exercise and cancer risk? “The evidence for an association between time-of-day specific activity with cancer risk is sparse and inconsistent. One study reported decreased colorectal cancer risk with morning and afternoon activity, whereas other investigations found no relations of activity timing to risks of breast and prostate cancer or cancer mortality” (Stein et al 2024 p2) (table 5.2).

STUDY	METHODOLOGICAL ISSUES	MAIN FINDING
Weitzer et al (2021)	Case control method; Spain; interviewer-assessed PA data	Non-significant reduced breast and prostate cancer and early morning PA; no relationship for mid-day and afternoon PA
Feng et al (2023)	Prospective study using UK Biobank data; accelerometer data divided into time intervals	No association of time of day with cancer mortality, but increased PA reduced the risk of a number of different cancers
Bai et al (2024)	UK Biobank accelerometer data	Morning and afternoon PA reduced risk of colorectal cancer; moderate-to-vigorous intensity PA at any time reduces risk

Table 5.2 - Three studies on timing of physical activity during the day and cancer risk.

Stein et al (2024) used data from the UK Biobank to study diurnal activity patterns and colorectal cancer specifically. A sub-sample of 103 000 participants were asked to wear an accelerometer on their dominant wrist continuously for seven days between 2013 and 2015. Four patterns of PA were distinguished - day-long (70% of the sample), late-day (17%), early- and late-day (9%), and mid-day and night-time PA (4%). Colorectal cancer (up to 2020-21) was taken from official records.

Full data were available on 86 252 participants (average age 62 years at accelerometry) with follow-up of

five years on average. There were 529 colorectal cancer cases in total.

Increasing level of day-long PA was significantly associated with lowered colorectal cancer risk, but still more benefit was seen with the early- and late-day group. The late-day group was similar, but not statistically significant. There was no relationship for mid-day and night-time PA. Interestingly, late-day activity was associated with stronger risk reduction for rectal than colon cancers, "hinting at a yet unknown link between physical activity and rectal cancer" (Stein et al 2024 p8).

The researchers concluded: "A pattern of early- plus late-day activity is related to reduced colorectal cancer risk, beyond the benefits of overall activity" (Stein et al 2024 p1). They continued: "The more pronounced benefit of the double peak activity pattern, as opposed to the single peak pattern, could be partially attributable to the advantage of distributing activities throughout both the morning and the afternoon, providing more comprehensive coverage of active time during the day" (Stein et al 2024 p7).

In summary, PA is better than sedentary behaviour for future cancer risk, specifically colorectal cancer, but PA peaks in the morning and evening are best it seems.

"The biologic mechanisms underlying how the timing of daily activity affects cancer risk remain elusive. Animal studies show that the circadian clock regulates metabolic responses to exercise, and that the timing of exercise plays a pivotal role in enhancing the positive effects of exercise on metabolic pathways and energy balance, which, in turn, is associated with cancer risk reduction" (Stein et al 2024 p8). Insulin resistance is probably also involved along with chronic low-grade inflammation, and melatonin (Stein et al 2024).

#### Evaluation of Stein et al (2024):

i) The categorisation of PA during the day used factor analysis to group them. "This method is free from pre-set assumptions about data structure, and it efficiently reduces data complexity and captures essential variation while maintaining the continuous nature of the data, rendering it ideal for understanding nuanced trends in time-series of raw accelerometry data" (Stein et al 2024 p8) (+).

ii) The general PA levels of the sample were "relatively high" (Stein et al 2024 p7) compared to the general population. This is the risk of "healthy volunteer bias" (Delgado-Rodriguez and Llorca 2004) (ie: "people who volunteer for research studies tend to be, on average, more health-conscious than non-participants" (Fry et al 2017 p1026) (-).

iii) A large sample of UK adults (+), though the UK Biobank sample is "healthier and wealthier" than the UK population as a whole (appendix 5A). Potential for "selection bias" (-).

iv) The type or intensity of PA were not measured, as Stein et al (2024) admitted, "potentially masking certain aspects affecting colorectal cancer risk, such as the benefits of short bursts of vigorous activity. The accelerometry data lacked contextual details, limiting insights into how different environments in which activity occurred could influence the impact of physical activity on colorectal cancer. Additionally, we did not examine whether chronotype or sleep patterns modified the association between activity timing and colorectal cancer" (p8) (-).

v) PA was measured at one point in time and this did not take account of major changes (eg: during the covid-19 pandemic) (-).

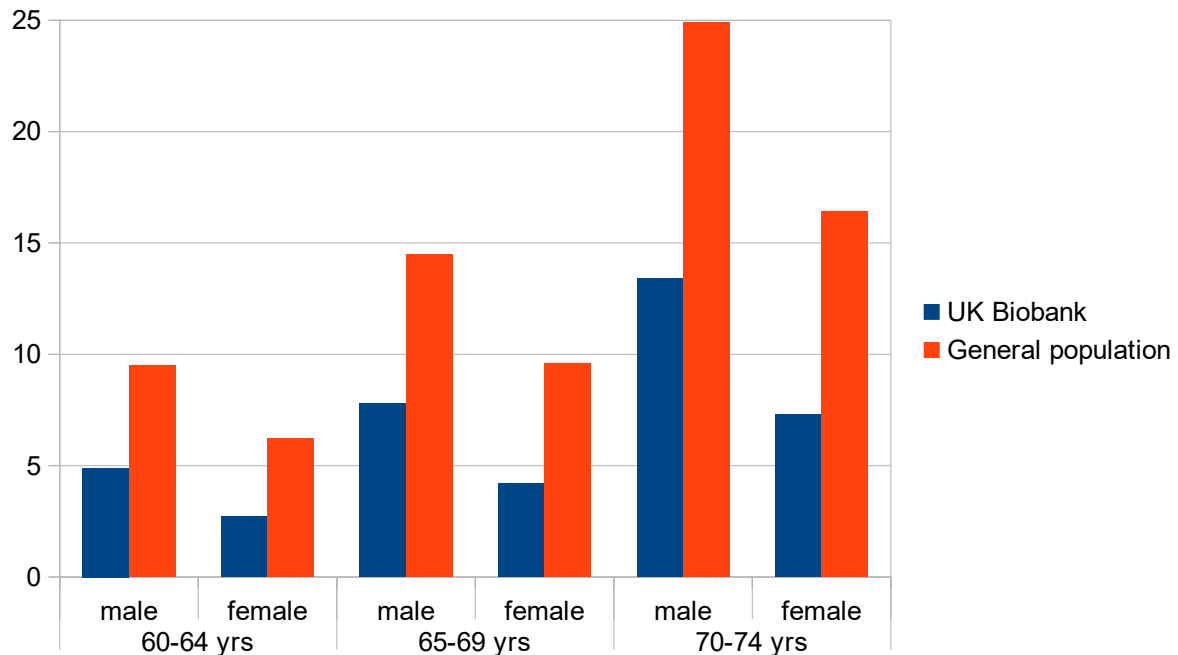
vi) Cancer diagnosis based on official records and standard diagnosis criteria (ICD-10 codes C18, C19 and C20) (+). But unreported, undetected and undiagnosed cases missed (-).

#### **5.4. APPENDIX 5A - UK BIOBANK SAMPLE**

Fry et al (2017) compared those who joined the UK Biobank at baseline with the UK Census data for 2001 and 2011. Follow-up until late 2015 for cancer and all-cause mortality was made from medical records.

The researchers summed up the findings: "UK Biobank participants were more likely to be older, to be female, and to live in less socio-economically deprived areas than non-participants. Compared with the general population, participants were less likely to be obese, to smoke, and to drink alcohol on a daily basis and had fewer self-reported health conditions. At age 70-74 years, rates of all-cause mortality and total cancer

incidence were 46.2% and 11.8% lower, respectively, in men and 55.5% and 18.1% lower, respectively, in women than in the general population of the same age. UK Biobank is not representative of the sampling population; there is evidence of a 'healthy volunteer' selection bias" (p1026) (figure 5.1).



(Data from Fry et al 2017 web table 4)

Figure 5.1 - Mortality rates per 1000 person-years in 2012 for selected age groups.

Looking at certain variables in more detail:

- White ethnicity - vast majority of UK Biobank participants (94.6%), which was similar to the 2001 Census (94.5%), but higher than the 2011 Census (91.3%).
- Obesity - UK Biobank less likely (eg: men 45-54 years BMI  $\geq 30$ : 25.6% vs 31.5%)
- Current smoking - less UK Biobank (eg: women 45-54 years: 11% vs 20%), but young smokers heavier smokers ( $\geq 20$  per day) than general population.

- Self-reported health conditions - lower in UK Biobank sample for hypertension, cardiovascular diseases, stroke, and diabetes, for example.

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## **6. EMPOWERMENT AND DIGITAL PILLS**

An anti-psychotic drug of the type aripiprazole, "Abilify MyCite" was approved for commercial use in the USA in November 2017 (Diedericks 2019). It was noteworthy in being the first "digital pill" (ie: a pharmaceutical tablet with a sensor embedded that transmits a signal to a sensor patch worn by the individual). "This sensor in turn transmits the information to both the patient's mobile device and that of the health care practitioner (HCP) and up to four other people who the patient has consented to receiving their data" (Diedericks 2019 p63). The key is the ability to monitor medication adherence.

Diedericks (2019) reflected on "digital medication" in a study involving ten interviews with experts and a document search <sup>6</sup>. Analysis of the latter found a "promissory discourse" that emphasised future benefits (for patients and the pharmaceutical industry). Diedericks (2020) noted: "Not only would digital pills or smart pills save costs in terms of potentially improving public health outcomes by improving patient adherence, but it is argued that digital monitoring systems shift the burden of public health onto the individual, assisting them at better managing their own health, and empowering them as patients" (p3).

But Diedericks (2020) then questioned what "patient empowerment" meant here: "Patient empowerment, an inherently positive concept, is deployed as a promissory tool by the industry. As such, it can be wielded in 'slippery' fashion to smooth over ethical concerns regarding the use of digital medication and to boost public perceptions of the technology" (p3).

The author continued: "By marketing a product that aims to create patients that are more self-reliant and 'in charge' of their own health, Abilify MyCite especially uses the patient empowerment narrative to mitigate worries about the vulnerable population that the first ever digital pill is aimed at. It is striking that no evidence was gathered or provided during the regulatory phase of Abilify MyCite to show it actually improves adherence and disease self-management, and most importantly, no evidence was supplied demonstrating that its use doesn't lead to further harmful psychotic delusions - something patients might struggle with should they be digitally monitored" (Diedericks 2020 p4).

Fumagalli et al (2015) talked about "empowerment as

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<sup>6</sup> One hundred and twenty documents from industry, health and regulatory authorities, academia, and mass media (Diedericks 2019).

an active behaviour" in the view of the pharmaceutical industry. "In such cases, patient empowerment does not reflect the patient as 'being empowered', nor does it reflect the process towards 'becoming empowered'. Rather, this sort of patient empowerment points towards a situation where patients have to assume responsibility for their own care (self-management) and decision-making" (Diedericks 2020 p6).

Gibson (1991) noted that empowerment can be seen as a process or as an outcome. "If seen as an outcome, empowerment is reduced to a quality or property of the patient. However, if empowerment is treated as a process,... it should be, then it allows for a collaborative undertaking between people, their communities, and organisations to gain 'mastery over their own lives (Gibson 1991)" (Diedericks 2020 p4).

Another ethical concern is about the patient data created and what happens with them (ie: the potential commercial use). Furthermore, the view is presented that "the data gathered will not only lead to additional information, but also a form of deep 'understanding' about one's body, and indeed the self. This better self-understanding is the basis of the claim that the digital pill is a 'patient empowerment tool'. Additionally, the digital pill is viewed as empowering because the insights that are gained from the data are 'actionable', that is, they lead to the necessary behavioural changes" (Diedericks 2020 p5).

Diedericks (2020) ended: "The development of technologies like digital medication could signal a growing trend in which investment in medical technological responses to social problems like non-adherence take precedent over investment in social responses. Findings from qualitative work and systematic reviews on non-adherence in schizophrenia and bipolar disorder suggest that patient perceptions of the conditions and beliefs about medication affect adherence... More generally, some of the most common barriers to adherence involved stigma of taking psychiatric medication, and a lack of a social support network, including housing and financial problems... Therefore, it is likely that approaches focussing on the person as a whole will be most effective in both alleviating social distress and improving clinical outcomes" (pp7-8).

It is interesting that there was the "almost absence of patient voice" in the development of "Abilify MyCite"

(Diedericks 2020).

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