Transdiagnostic approaches to mental health

Impact paragraph

In this section, the scientific and societal impact of the research presented in this thesis will be discussed.

Scientific impact

Despite extensive research on mental health, significant individual suffering, and high societal costs, treatment effectiveness has remained relatively stable in recent years, especially for severe mental disorders [1]. These findings contrast sharply with significant advances in other medical disciplines and a wide variety of somatic diseases, where treatment options and effectiveness have significantly improved. Some of the current difficulties in mental health research in finding better treatment options may partly be explained by fundamental difficulties in applying the dominant traditional medical model to mental health conditions. The long-held belief that mental disorders are distinct disease entities with unambiguous phenotypic representation and biological correlates as well as disease-specific mechanisms and risk factors is increasingly being challenged by mounting evidence indicating a high degree of overlap between mental disorders on the genetic [2], neuroscientific [3], and behavioural level [4]. This implies that studying mental disorders in isolation introduces inherent problems that may obstruct significant progress towards developing novel therapeutic approaches as well as understanding important determinants of poor mental health and underlying mechanisms.

The primary objective of this thesis was to take a transdiagnostic approach to mental health by examining how cognitive factors, adverse childhood experiences, and candidate mechanisms contribute to an increased risk for developing transdiagnostic phenotypes of depression, anxiety, and psychosis. The thesis also sought to determine the extent to which digital interventions have the potential to target transdiagnostic candidate mechanisms and outcomes, as well as to alleviate mental health burden in various areas of public mental health provision (i.e., mental health promotion, prevention of, and treatment for mental disorder).

We found that the jumping to conclusions (JTC) reasoning bias - the most widely studied cognitive bias in psychosis - was more likely to occur and associated with an increased risk for psychosis progression and persistence in individuals with a transdiagnostic phenotype of co-occurring affective dysregulation and

psychotic experiences in a large prospective cohort study. This suggests, for the first time, that the JTC bias extends to transdiagnostic phenotypes. Moreover, stress sensitivity has been found to constitute a putative transdiagnostic risk and resilience mechanism linking adverse childhood experiences and mental health in youth at a developmental early stage of psychopathology using an ecologically valid experience sampling study design. We have also demonstrated that a compassion-focused ecological momentary intervention may be effective in directly targeting candidate mechanisms, including stress sensitivity, and strengthening resilience in young help-seeking service users. Finally, digital interventions have been found to increasingly being used, and hold great promise for, mental health promotion and the prevention and treatment of mental disorders.

These findings emphasize the importance of conducting additional research to determine whether psychological processes and mechanisms involved in the development and maintenance of psychopathologies extend to transdiagnostic phenotypes in order to overcome current limitations in mental health research and to corroborate contemporary aetiological models (e.g., the integrated socio-developmental-cognitive model of psychosis [5]). This may ultimately improve prediction of onset, course, and outcome, and to help develop and implement more effective and person-tailored interventions. Studies that do not exclude but purposefully allow for comorbidities and multidimensional psychopathology are urgently needed to advance progress in research, treatment, and aetiological models as well as dimensional and transdiagnostic approaches to mental health [6, 7].

Anticipated societal impact

> *"The time will come when diligent research over long periods will bring to light things which now lie hidden. A single lifetime, even though entirely devoted to the sky, would not be enough for the investigation of so vast a subject (...) And so this knowledge will be unfolded only through long successive ages. There will come a time when our descendants will be amazed that we did not know things that are so plain to them (...) Many discoveries are reserved for ages still to come, when memory of us will have been effaced."*
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> *Lucius Annaeus Seneca (c. 4 BC – AD 65), Naturales quaestiones.*

According to the Global Burden of Disease study, an estimated 792 million people worldwide suffered from a mental disorder in 2017 [8]. This is slightly more than one in every ten people on the planet (10.7 percent). The majority of these individuals suffered from anxiety or depression. When substance use disorders are included, the numbers rise even higher: approximately one-in-seven people (15 percent) worldwide. There is strong evidence that individuals with mental health or substance use disorders are at an increased risk of committing suicide [9] and the immense individual suffering associated with mental illness can hardly be expressed in numbers. The economic cost of psychopathologies has been estimated to be 600 billion euros a year, or more than 4% of GDP, in the European Union. This figure includes 190 billion euros (1.3 percent of GDP) for direct care, 170 billion euros (1.2 percent) for social security programs, and 260 billion euros (1.6 percent) for indirect public spending on unemployment and decreased productivity among people with mental disorders [10].

These staggeringly high rates of mental disorders and tremendous costs clearly demonstrate the critical need to improve support for people experiencing mental health difficulties, identify important risk factors early, and strengthen the population's resilience. The thesis contributes to a better understanding of how exposure to adversity, which millions of people face on a daily basis, and cognitive factors increase the risk of developing multidimensional mental health problems. Moreover, reported findings on the COVID-19 pandemic indicate that public health measures to reduce infection rates had detrimental effects on youth mental health. This is a significant finding that requires careful consideration when making decisions about how to properly manage this and future pandemics effectively.

The reported findings on the use of digital interventions are encouraging. We demonstrated that digital intervention, mHealth apps in particular, hold great potential to enable the delivery of highly personalized interventions that are tailored to an individual's specific needs in a given moment and context. They are especially well-suited for improving public mental health because they are easily scaled up and the devices required to deliver evidence-based interventions in daily life are readily available to most people. Additionally, the thesis may aid in a better understanding of the current state of evidence-based mental health services and in assisting decision makers in developing and implementing digital strategies during public health crises.

The research topics covered in this thesis have the potential to enhance the reputation and impact of the regional academic community in the field of mental health. The findings from the studies presented in this thesis have been featured in news outlets, and they may help service users, the public, and policymakers make more informed decisions about the use of technology to enable mental health services, as well as contribute to a broader discussion about their potential and limitations.

However, as Seneca so beautifully stated, scientific discoveries typically take time to reach their full potential for societal benefit, and the findings presented in this thesis represent yet another step forward in the long process of improving societies' mental health.

References

1. Kilbourne, A.M., et al., Measuring and improving the quality of mental health care: a global perspective. World Psychiatry, 2018. 17(1): p. 30-38.
2. Anttila, V., et al., Analysis of shared heritability in common disorders of the brain. Science, 2018. 360(6395).
3. Janiri, D., et al., Shared Neural Phenotypes for Mood and Anxiety Disorders: A Meta-analysis of 226 Task-Related Functional Imaging Studies. JAMA Psychiatry, 2020. 77(2): p. 172-179.
4. van Os, J. and U. Reininghaus, Psychosis as a transdiagnostic and extended phenotype in the general population. World Psychiatry, 2016. 15(2): p. 118-24.
5. Howes, O.D. and R.M. Murray, Schizophrenia: an integrated sociodevelopmental-cognitive model. Lancet, 2014. 383(9929): p. 1677-1687.
6. Reininghaus, U., et al., Evaluation of the validity and utility of a transdiagnostic psychosis dimension encompassing schizophrenia and bipolar disorder. Br J Psychiatry, 2016. 209(2): p. 107-13.
7. van Os, J., et al., The evidence-based group-level symptom-reduction model as the organizing principle for mental health care: time for change? World Psychiatry, 2019. 18(1): p. 88-96.
8. Global Burden of Disease Study 2019, (GBD 2019). Data Input Sources Tool. [cited 2021 01.05.2021]; Available from: http://ghdx.healthdata.org/gbd-2019/data-input-sources.
9. Prince, M., et al., No health without mental health. The Lancet, 2007. 370(9590): p. 859-877.
10. World Health Organization, Health at a Glance: Europe. 2018.