

Narrative academic profile

Since 2007 I am head of the research group “Longitudinal and Intervention Research” at the Department of Psychiatry and Psychotherapy. My research priorities include cognitive, neurobiological and psychosocial risk factors for the onset and course of mental disorders, experimental psychotherapy, and the development of psychodiagnostic tools. Currently, I am principal investigator of two DFG funded projects (volume 727.000 Euro) and cooperation partner in a number of other projects. I have been active in several committees, e.g., as the co-chair of the section Epidemiology and Social Psychiatry of the European Psychiatric Association (EPA, until 2022) and as elected official of the German Society of Psychology (DGPs) participating in the Working Group for the National Disease Management Guidelines for unipolar depression. I regularly act as a reviewer for the DFG and for several peer-reviewed international journals. I also hold seminars for the advanced training of junior psychiatrists and for other professions at the ZI Academy.

1. Contribution to science

1.1 Current research topics

Cognitive vulnerability to depression

A main focus of our scientific work is the study of rumination as a cognitive vulnerability factor for the onset and course of depression. I started working on this topic about 20 years ago, when it was largely understudied in Germany. Since then we studied the subject in eight single projects funded by the DFG and in a subproject of the DFG Collaborative Research Project 636.

Our research approaches include longitudinal surveys, experimental laboratory and intervention studies, EEG, fMRI and genetics (in cooperation with other researchers at the CIMH), and Ambulatory Assessment (AA). In longitudinal studies we found rumination to deteriorate the clinical course of depression and quality of life in depressed patients and the course of depressive symptoms in nonclinical samples over time (KU1464/1-1,3). In experimental studies, we showed that an induced ruminative focus in the lab increased dysfunctional thinking and delayed cortisol decrease, and that emotional reactivity toward rumination induction in the lab predicted high depression scores one year later (KU1464/1-4). A combined AA/fMRI study conducted in cooperation with P. Kirsch (Department of Clinical Psychology) showed that increased rumination during daily life was linked to hyperconnectivity of the default mode network and to increased cortisol secretion during daily life in remitted recurrently depressed individuals (KU1464/4-1). In cooperation with the University of Pennsylvania, we showed that rumination during daily life is increased in individuals with low between-network connectivity of the fronto-parietal and the salience network. We furthermore developed an experimental AA paradigm to induce rumination and a mindful self focus during daily life, and showed that a 4-weeks mindfulness-based attention training improved mood and rumination in everyday life in remitted depressed patients, especially in those with a history of frequent lifetime episodes (DFG KU1464/4-2).

In a 4.4-year follow-up of this cohort we currently investigate associations of momentary rumination with executive control processes and longitudinal associations of momentary cognitive, affective, and physiological stress indicators in a measurement burst study (DFG KU1464/8-1). I think that our diversified approach to study cognitive vulnerability to depression

has yielded relevant results both with respect to basic research and clinical applications. Selected papers:

- Beddig, T., Timm, C., Ubl-Rachota, B., & Kuehner, C. (2020). Mindfulness-based focused attention training versus progressive muscle relaxation in remitted depressed patients: Effects on salivary cortisol and associations with subjective improvements in daily life. *Psychoneuroendocrinology*, 113, 104555.
- Kuehner, C., Schricker, I.F., Nayman, S., Reinhard, I., Zamoscik, V., Kirsch, P., Huffziger, S. (2023) Effects of rumination and mindful self-focus inductions during daily life in patients with remitted depression: an experimental ambulatory assessment study. *Behavior Therapy*. <https://doi.org/10.1016/j.beth.2023.04.002>.
- Lydon-Staley, D., Kuehner, C., Zamoscik, V. et al. (2019). Repetitive negative thinking in daily life and functional connectivity among default mode, fronto-parietal, and salience networks. *Translational Psychiatry*, 9, 234.
- Schricker, I.F., Nayman, S., Reinhard, I., & Kuehner, C. (2023a). Reciprocal Prospective Effects of Momentary Cognitions and Affect in Daily Life and Mood Reactivity Toward Daily Events in Remitted Recurrent Depression. *Behavior Therapy*, 54, 274-289. doi: 10.1016/j.beth.2022.09.001.
- Schricker, I.F., Nayman, S., Reinhard, I., & Kuehner, C. (2023b). Trait and state effects of different modes of thinking on salivary cortisol in daily life in patients with recurrent major depression and healthy individuals. *Psychoneuroendocrinology*, 155, 106307
- Timm, C., Rachota-Ubl, B., Beddig, T., ..., & Kuehner, C. (2018). Mindfulness-based attention training improves cognitive and affective processes in daily life in remitted patients with recurrent depression. *Psychotherapy and Psychosomatics*, 87, 184-186.

Gender and mental disorders

From the beginning of my scientific career, I was interested in investigating gender aspects in mental disorders. Earlier work included the examination of gender differences in the clinical course of depression and the role of stalking victimization for gender differences in mental health. I also completed two invited reviews on gender differences in depression and was involved in a large metaanalysis on possible gender differences in the efficacy of cognitive behavioral therapy and pharmacotherapy. More recent work includes the study of cycle-related aspects in mental disorders, including invited reviews on mental disorders during peripartum and on premenstrual exacerbations of mood disorders, and my current DFG study on Premenstrual Dysphoric Disorder (KU1464/6-1,3, 2016-2024). Here; we use AA which is particularly suitable to investigate within-person changes in subjective and physiological processes across the menstrual cycle. In the first funding period (2016-2019) we identified higher stress reactivity and a closer relationship between rumination and negative affect pointing to a negative upward spiral, particularly in the luteal phase of affected women. They also showed reduced dynamics of HPA axis activity comparable to patients with other stress-related disorders. AA-characteristics such as high negative affect, stress-related rumination, and low cortisol levels predicted a worse clinical course of PMDD symptomatology over time. In 2020, I received DFG funding (volume 450.000 Euro) for the second project period. We extended the design with repeated experimental inductions of ruminative and mindful self-foci during daily life during the follicular and the premenstrual phase to investigate whether women with PMDD are particularly vulnerable toward an induced dysfunctional thinking mode and less reactive to a functional mode during the premenstrual phase. A further extension is the implementation of an AA follow-up with a measurement burst design. Surprisingly, PMDD is

totally understudied in Germany and also largely unknown to clinical practitioners, and our project is currently (7/23) the only one funded by the DFG under this topic. Selected papers:

- Beddig, T., Reinhard, I., & Kuehner, C. (2019). Stress, mood, and cortisol during daily life in women with premenstrual dysphoric disorder (PMDD). *Psychoneuroendocrinology*, 109, 104372.
- Beddig, T., Reinhard, I., Ebner-Priemer, U., & Kuehner, C. (2020). Reciprocal effects between cognitive and affective states in women with Premenstrual Dysphoric Disorder: An Ecological Momentary Assessment study. *Behaviour Research and Therapy*, 131, 103613.
- Beddig, T., & Kuehner, C. (2020). Ambulatory assessment characteristics predict the clinical course of premenstrual dysphoric disorder. *Psychotherapy and Psychosomatics*, 89, 393-395.
- Kuehner, C. (2017). Why is depression more common among women than among men? *The Lancet Psychiatry*, 4, 146-158.
- Nayman, S., Beddig, T., Reinhard, I., & Kuehner, C. (2022). Effects of cognitive emotion regulation strategies on mood and cortisol in daily life in women with premenstrual dysphoric disorder. *Psychological Medicine*, 1-11.
- Nayman S, Konstantinow DT, Schricker IF, Reinhard I, & Kuehner C. (2023). Associations of premenstrual symptoms with daily rumination and perceived stress and the moderating effects of mindfulness facets on symptom cyclicity in premenstrual syndrome. *Archives of Womens Mental Health*, 26, 167-176.

Other recent research topics in cooperation with internal and external groups

Community studies on stalking. We published the first community study on the prevalence and impact of stalking in Germany in 2005. This former study has contributed to the implementation of a specific offense of stalking added to the German Criminal Code in 2007. In 2020, we replicated this study in another community sample and showed that the prevalence of stalking was stable over time. Reported stalking victimization was associated with marked impairments in mental health and an increase in mental disorder syndromes. Paper:

- Dressing, H., Gass, P., Schultz, K., & Kuehner, C. (2020). The prevalence and effects of stalking: a replication study. *Deutsches Ärzteblatt International*, 117, 347.

Community study on associations of the COVID-19 pandemics on the mental health in the community. Together with H. Dressing and P. Gass, we conducted a representative community study on mental health effects of the COVID-19 pandemic by comparing the results of this survey conducted in June 2020 with results from our 2018 survey. We did not identify a clear increase in mental problems or syndromes but identified several individual risk and protective factors that were independently related to mental health during this early stage of the pandemic. Papers:

- Kuehner, C., Schultz, K., Gass, P., Meyer-Lindenberg, A., & Dreßing, H. (2020). Mental health status in the community during the COVID-19-pandemic. *Psychiatrische Praxis*, 47, 361-369.
- Dreßing H, Schultz K, Gass P, Meyer-Lindenberg A, & Kuehner C. (2021). Complementary Study. *Deutsches Ärzteblatt International*, 118, 179.

- Dreßing, A., Hosp, J., Kuehner, C., Dreßing, H., & Meyer-Lindenberg, A. (2021). Neuropsychiatrische Folgen der COVID-19-Pandemie. *Fortschritte der Neurologie-Psychiatrie*, 89(06), 296-301.

Contribution to the Swiss ColaUS/PsyColaUS population study. This study is a large population-based multidisciplinary study funded by the Swiss National Fund on risk factors for somatic and mental diseases in the elderly population, where I introduced and supervised the saliva cortisol assessments and contributed to publications. Selected papers:

- Gebreab, S. Z., Vandeleur, C. L., Rudaz, D., Kuehner, C. et al. (2018). Psychosocial stress over the lifespan, psychological factors, and cardiometabolic risk in the community. *Psychosomatic Medicine*, 80(7), 628-639.
- Haba-Rubio, J., Ouane, S., Franc, Y., ..., Kuehner, C., et al. (2018). Do diurnal cortisol levels mediate the association between sleep disturbances and cognitive impairment? *Neurobiology of Aging*, 69, 65-67.
- Ouane, S., Castelao, E., von Gunten, A., Kuehner, C., Preisig, M., & Popp, J. (2020). Salivary cortisol and five-year change in cognitive performance in non-demented elderly subjects: a population-based study. *Neurobiology of Aging*, 94, 34-37.

Cooperation project on mindwandering, physical activity, sleep and executive control.

In cooperation with D. Marcusson-Clavertz (University of Lund, Sweden), we investigate associations between executive control processes and mindwandering, rumination, physical activity and sleep in daily life in a sample of 220 young adults (n=70 from our group). Papers:

- Gort, C., Marcusson-Clavertz, D., & Kuehner, C. (2021). Procrastination, affective state, rumination, and sleep quality: Investigating reciprocal effects with ambulatory assessment. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 39(1), 58-85.
- Marcusson-Clavertz, D., Persson, S. D., Cardeña, Terhune, D. B., Gort, C., & Kuehner, C. (2022). The contribution of latent factors of executive functioning to mind wandering: an experience sampling study. *Cognitive Research: Principles and Implications*, 7, 1-25.
- Marcusson-Clavertz D., Persson, S.D., Davidson, P., Kim, J., Cardeña, E., & Kuehner, C. (2023). Mind wandering and sleep in daily life: A combined actigraphy and experience sampling study. *Consciousness and Cognition*, 107, 103447.

Cooperation project on psychometric properties of the German BDI-II. In this cooperation project, we analysed the screening performance of the German BDI-II against a structured clinical interview (SCID) with data from 638 participants from all of our previous and current individual and cooperation studies. Paper:

- Kuehner, C., Keller, F., Schrick, I., ..., & Diener, C. (2023). Diagnostic performance and validity of the German version of the BDI-II – a secondary analysis with data from clinical and nonclinical samples. *Psychiatrische Praxis*, 50, 36-42.

Selected further cooperations

- Bohus, M., Kleindienst, N., Hahn, C., ..., Kuehner, C., ..., Priebe, K. (2020). Dialectical behavior therapy for posttraumatic stress disorder (DBT-PTSD) compared with cognitive processing therapy (CPT) in complex presentations of PTSD in women survivors of childhood abuse: a randomized clinical trial. *JAMA Psychiatry*, 77, 1235-1245

- Kockler, T. D., Santangelo, P. S., Eid, M., Kuehner, C., Bohus, M., Schmaedeke, S., Ebner-Priemer, U. W. (2022). Self-esteem instability might be more characteristic of borderline personality disorder than affective instability: Findings from an e-diary study with clinical and healthy controls. *Journal of Psychopathology and Clinical Science*, 131, 301.
- Hoffmann, S., Gerhardt, S., Mühle, C., ..., Kuehner, C., ..., & Lenz, B. (accepted). Associations of Menstrual Cycle and Progesterone/Estradiol Ratio with Real-Life Alcohol Consumption in Alcohol Use Disorder: A Sex-Separated Multicenter Intensive Longitudinal Study. *American Journal of Psychiatry*.

1.2 Education and support of young scientists

Teaching, training and supervision of my young scientific staff is essential for me. Since the beginning of my work as a mentor, I am privileged to work with highly motivated, enthusiastic and very productive young scientists. Since 2020, I supervised five PhD students and several bachelor and master students. I am also co-advisor for other doctoral students at the Faculty and at external universities (since 2020: 18 written reports, 12 oral exams).

1.3 Practical dissemination of scientific work and knowledge

Training of medical and nursing staff at the ZI Academy and dissemination of scientific knowledge in practical lectures and textbooks. I am engaged in the internal advanced training and continuing education of colleagues in the field of clinical psychology and psychotherapy at the ZI Academy including medical doctors within their psychiatry curriculum and colleagues from the nursing team. As a member of the steering committee of the corporate health management of the CIMH, I also offer seminars to ZI colleagues with a focus on self-care applications derived from my scientific work. I disseminate my scientific knowledge in contributions to practical textbooks and journals and in talks for practitioners and the general public. Examples:

- Kühner, C. (2021). [Light and shadow – close together]. *Hebammen Wissen*, 2(1), 10-14.
- Kühner, C. (2022). [Depression: A women's disease?] *Der Hausarzt*, 8, 1-6.
- Kühner C. & Nayman S. (2022) [Premenstrual Dysphoric Disorder – a challenge for patients and practitioners]. Lecture at the Abendakademie Mannheim (30.09.22) with broadcasts on radio (DLF) and Youtube
- Contribution to the podcast „[PMDD: When the cycle changes personality]“ (18.1.2023) <https://www.apotheken-umschau.de/podcast/episode/the-sex-gap-der-podcast-zu-geschlechtergerechter-medizin/pmds-wenn-der-zyklus-die-persoenlichkeit-veraendert-936997.html>

2. Key output of the years 2020 – now (update: 7/2023)

Since 2020, I implemented two new projects, published 26 peer-reviewed articles (5 firstauthorships, 13 seniorauthorships, 8 coauthorships) and three handbook chapters, and contributed to scientific committees. I will describe the following activities in more detail.

- ### 2.1 Beddig, T., Timm, C., Ubl-Rachota, B., ..., & Kuehner, C. (2020). Mindfulness-based focused attention training versus progressive muscle relaxation in remitted depressed patients: Effects on salivary cortisol and associations with subjective improvements in daily life. *Psychoneuroendocrinology*, 113, 104555.

Research on effects of mindfulness interventions on cortisol in recurrently depressed patients is important to identify possible physiological pathways through which these interventions may prevent recurrence. We previously showed that a 4-weeks mindful attention training (MBAT) reduced rumination and negative affect (NA) in daily life compared to an active control condition (PMR, KU1464/4-2). In this study, my PhD student Theresa Beddig investigated whether pre-post changes in NA and rumination predicted changes in cortisol activity. In both groups, total cortisol increased pre-post, but MBAT patients with larger reductions in NA and rumination maintained their initial levels, therefore MBAT appeared to buffer against increasing cortisol levels over time in this subgroup. This paper links for the first time core elements of the vulnerability model of mindfulness-based interventions (rumination and NA) with cortisol as a stress biomarker in a randomized controlled trial.

2.2 Kuehner, C., & Nayman, S. (2021). Premenstrual exacerbations of mood disorders: findings and knowledge gaps. *Current Psychiatry Reports*, 23, 1-11.

In this invited review, we reviewed diagnostic issues, epidemiology, possible mechanisms, and treatment options for premenstrual exacerbations (PME) of mood disorders. Research on PME of mood disorders is extremely scarce, and these conditions are sometimes mixed up with PMDD. However, the overlap of underlying biological mechanisms in PMEs and PMDD remain unclear, and the conditions require different treatments. This is the first comprehensive review on a relevant but rather neglected issue in premenstrual disorder research.

2.3 Nayman, S., Beddig, T., Reinhard, I., & Kuehner, C. (2022). Effects of cognitive regulation strategies on mood and cortisol in daily life in women with Premenstrual Dysphoric Disorder. *Psychological Medicine*, 1-11.

In this paper, my PhD student Sibel Nayman examined the predictive value of habitual emotion regulation (ER) strategies for the course of mood and basal cortisol activity across the cycle in women with PMDD. Women using more favourable ER-strategies showed generally improved mood, however, they showed stronger mood deterioration toward the premenstrual phase, thereby resembling those with less favorable strategies toward the end of the cycle. This is the first AA-study investigating effects of psychological traits on within-person processes across the cycle in PMDD. It shows for the first time empirically what affected women tell us: they are not able to profit from functional cognitive ER-strategies during the premenstrual phase. This points to a major role of biological factors in PMDD, and we argue that future psychotherapy research should study effects of *behavioral* strategies, e.g. as used in DBT, to deal with PMDD.

2.4 Nayman S, Konstantinow DT, Schricker IF, Reinhard I, Kuehner C. (2023). Associations of premenstrual symptoms with daily rumination and perceived stress and the moderating effects of mindfulness facets on symptom cyclicity in premenstrual syndrome. *Archives of Womens Mental Health*, 26, 167-176.

In this paper, my PhD student Sibel Nayman investigated a sample with a wide range of premenstrual symptoms not reaching PMDD-criteria via an online diary study over two menstrual cycles and analysed within-person associations of premenstrual symptoms with daily rumination and perceived stress during the late luteal phase as well as cycle-phase specific associations of habitual mindfulness with premenstrual symptoms and impairment. In contrast to Nayman et al. (2022), higher present moment awareness and acceptance predicted lower premenstrual symptoms and impairment in this less severely affected group and could represent useful targets for interventions in women with subthreshold levels of PMDD.

2.5 Schricker, I.F., Nayman, S., Reinhard, I., & Kuehner, C. (2023a). Reciprocal

Prospective Effects of Momentary Cognitions and Affect in Daily Life and Mood Reactivity Toward Daily Events in Remitted Recurrent Depression. *Behavior Therapy*, 54, 274-289.

In this paper, my PhD-student Isabelle Schricker showed that in remitted recurrently depressed patients dysfunctional thoughts and mood influence each other more closely than in healthy individuals. These patients also show affective and cognitive “brightening” following positive daily events. This study has clear clinical implications suggesting that future relapse prevention studies should shift their focus toward the “upward spiral” of positive affect, cognitions, and pleasant events.

2.6 Schricker, I.F., Nayman, S., Reinhard, I., & Kuehner, C. (2023b). Trait and state effects of different modes of thinking on salivary cortisol in daily life in patients with recurrent major depression and healthy individuals. *Psychoneuroendocrinology*, 155, 106307

In this paper, my PhD student Isabelle Schricker showed that dysfunctional cognitions (repetitive negative thinking) at the trait level predicted higher cortisol levels in daily life in recurrently depressed patients and healthy individuals, and state mindwandering and mentalshift problems predicted increased cortisol 20 min later. State variables did not mediate the association between dysfunctional RNT and cortisol. This study demonstrates that dysfunctional thoughts at both the trait and state level may independently act as internal stressors activating the HPA axis. Observed larger effects in the patient sample point to their heightened physiological vulnerability toward these stressors. This paper has been selected as an “Editor’s choice” article in PNEC.

2.7 Schricker, I.F., Nayman, S., Reinhard, I., & Kuehner, C. (under 3rd review). Reactivity toward daily events: intraindividual variability and change in recurrent depression – a measurement burst study.

The combination of intensive repeated assessments of daily life experiences from different “waves” (bursts) using Ambulatory Assessment (AA) and illness-related factors measured at the macro-level over longer-term intervals is an innovative approach for dynamic modelling of mental disorders, but has not yet been applied in longitudinal studies on depression. In this study, my PhD-student Isabelle Schricker investigated variability and change of reactivity toward negative and positive daily events in patients with recurrent depression and the moderating role of slow-scale depression levels, using two bursts separated by 4.4 years. She demonstrated that it is important to distinguish within- and between-subject components in this design, e.g., by showing that in bursts with higher depression levels, affective reactivity toward negative events was blunted, whereas patients with higher depression levels (between-subject component) showed an increase in affective stress reactivity following negative events over bursts. This is the first MB-study on recurrent depression, and it shows that respective designs can provide relevant prognostic information beyond “classical” illness-related factors at the macro level. Isabelle was awarded with two poster prizes for this study (ZiHub 2022, SAA conference 2023).

2.8 Contribution to the National Guidelines for Unipolar Depression

Since 2009, I am an active member of the Working Group “National Disease Management Guideline Unipolar Depression” (NVL, now Version 3) as elected official of the German Society of Psychology. The recommendations of the NVL have a large impact on depression treatment and disease management programs in Germany, and I appreciate very much contributing to

this important project. While the main part of the NVL guidelines has been published in September 2022, I am still part of the working group on gender-related aspects, which will be published together with other supplementary chapters in 2024.

3. Future perspective

New projects are not planned, since I will be retiring end of 2023. My current DFG projects will be completed, and we plan to publish further important aspects from our projects. In parallel, I will extensively support my PhD students in completing their PhD theses and help them preparing next steps for their future career such as writing proposals for planned own research.