# Adapting to Change: A Longitudinal Analysis of ECEC Professionals' Loads, Load Reactions, and Resources During the COVID-19 Pandemic

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## Abbreviations

| | |
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| ECEC | Early Childhood Education and Care |
| RKI | Robert-Koch-Institute |
| SEB | Self-Efficacy Beliefs |
| ER | Emotion Regulation |

## Abstract

This dissertation investigates the impact of COVID-19-related loads on early childhood education and care (ECEC) professionals in Germany, with a particular focus on pandemic-related loads, subjective stress experience, self-efficacy beliefs, affective well-being, and COVID-19-related mental strain across different phases of the pandemic. Drawing on the BRB model (Rudow & Fischer, 2023) this work explores the complex interplay between pandemic-related loads and psychological responses. The dissertation comprises three complementary studies – two quantitative longitudinal studies and one qualitative study – that together offer a differentiated and dynamic perspective on the loads experienced in the ECEC context during the crisis.

Study 1 examines changes in stress experience and self-efficacy beliefs across different phases of the pandemic, distinguishing between intra- and interindividual effects, and investigates the relationship between these two constructs across the course of the COVID-19 pandemic. Study 2 analyzes the associations between pandemic-related loads (infection threat, economic threat) and both affective well-being and mental strain, as well as their phase-specific changes, and tests the moderating role of emotion regulation strategies (e.g., cognitive reappraisal, expressive suppression). Study 3 provides in-depth qualitative insights into institutional, interactional, and leadership-related loads, along with positive experiences, based on interviews with ECEC leaders.

The findings of this dissertation demonstrate that COVID-19-related loads had distinct effects on the affective well-being and mental strain of ECEC professionals. The analyses show that both infection and economic threats significantly contributed to diminished well-being and elevated mental strain, while emotion regulation strategies – particularly cognitive reappraisal – served as a protective factor. The qualitative findings I generated further highlight that ECEC leaders faced specific and complex multiple burdens, many of which were not adequately buffered by systemic support structures. Theoretical implications are discussed within the framework of the BRB model, which was conceptually further developed in the course of this dissertation. On a practical level, my findings point to concrete pathways for supporting ECEC professionals and leaders during times of crisis.

This dissertation makes a substantial contribution to the growing body of research on work-related loads in the ECEC sector by showing how dynamic constellations of loads and resources – and their effects on psychological well-being – evolve over time. It sheds light on key

psychological and organizational factors that have thus far received limited attention and underscores the need for a multidimensional understanding of how demands and coping processes unfold throughout crises. By integrating qualitative and quantitative approaches and further developing the BRB model, this work provides practice-oriented recommendations for research, policy, and institutional stakeholders – particularly with regard to structural support and the promotion of resilience in the field of early childhood education and care.

*Keywords*: COVID-19 pandemic, early childhood education and care (ECEC), ECEC professionals, ECEC leaders, preschool, well-being, Longitudinal study, multilevel analysis

## Abstract (German)

Diese Dissertation untersucht die Auswirkungen COVID-19-bedingter Belastungen auf pädagogische Fachkräfte in Deutschland – insbesondere in Bezug auf pandemiebezogene Belastungen, subjektives Stresserleben, Selbstwirksamkeit, affektives Wohlbefinden und mentale Belastung im Verlauf verschiedener Phasen der Pandemie. Auf Grundlage des BRB-Modells (Belastungs-Ressourcen-Beanspruchungs-Modell, Rudow and Fischer (2023)) wird die komplexe Wechselwirkung zwischen pandemiebezogenen Belastungen und psychischen Reaktionen untersucht. Die Arbeit umfasst drei komplementäre Studien: zwei quantitative Längsschnittstudien und eine qualitative Studie, die gemeinsam ein differenziertes und dynamisches Bild des Belastungserlebens im Bereich der frühkindlichen Betreuung, Bildung und Erziehung während der Krise zeichnen.

Studie 1 untersucht Veränderungen im Stresserleben und in den Selbstwirksamkeitserwartungen über verschiedene Phasen der Pandemie, differenziert zwischen intra- und interindividuellen Effekten und untersucht die Beziehung zwischen diesen beiden Konstrukten im Verlauf der Zeit. Studie 2 analysiert die Zusammenhänge zwischen pandemiebedingten Belastungen (Infektionsbedrohung, wirtschaftliche Bedrohung) und sowohl affektivem Wohlbefinden als auch mentaler Belastung sowie deren phasenspezifischen Veränderungen und prüft die moderierende Rolle von Emotionsregulationsstrategien (z. B. kognitive Neubewertung, expressive Unterdrückung). Studie 3 liefert vertiefte qualitative Einblicke in institutionelle, interaktionale und führungsbezogene Belastungen sowie positive Erfahrungen, basierend auf Interviews mit Leitungskräften im Bereich der frühkindlichen Bildung und Betreuung.

Die Ergebnisse zeigen, dass COVID-19-Belastungen das emotionale und mentale Befinden von Fachkräften unterschiedlich beeinflussen. Infektions- und wirtschaftsbezogene Bedrohungen wirken belastend, wobei Emotionsregulation als Schutzfaktor fungieren kann. Die qualitative Studie macht zudem deutlich, dass Leitungskräfte spezifischen Mehrfachbelastungen ausgesetzt waren, die häufig unzureichend systemisch abgefedert wurden. Die theoretischen Implikationen werden im Rahmen des BRB-Modells diskutiert, das im Zuge der Dissertation konzeptionell weiterentwickelt wurde. Praktisch liefern die Ergebnisse Ansatzpunkte zur gezielten Unterstützung pädagogischer Fach- und Führungskräfte in Krisenzeiten.

Damit leistet die Dissertation einen substanziellen Beitrag zur Forschung über berufsbezogene Belastungen im Bereich der frühkindlichen Betreuung, Bildung und Erziehung, indem sie differenziert aufzeigt, wie dynamische Belastungskonstellationen und Ressourcenlagen das psychische Wohlbefinden pädagogischer Fachkräfte während der COVID-19 Pandemie beeinflussen. Sie beleuchtet zentrale psychologische und organisationale Einflussfaktoren, die bisher nur unzureichend berücksichtigt wurden, und unterstreicht die Notwendigkeit eines mehrdimensionalen Verständnisses von Belastungsverläufen im Zeitverlauf. Durch die Verbindung qualitativer und quantitativer Zugänge sowie die konzeptionelle Weiterentwicklung des BRB-Modells liefert die Arbeit praxisrelevante Empfehlungen für Forschung, Politik und Trägerinstitutionen, insbesondere im Hinblick auf die strukturelle Unterstützung und Resilienzförderung im Bereich der frühkindlichen Betreuung, Bildung und Erziehung.

*Schlüsselworte*: COVID-19-Pandemie, Frühkindliche Bildung (FBBE), Pädagogische Fachkräfte, Kitaleitungen, Wohlbefinden, Längsschnittstudie, Mehrebenenanalyse

## List of Manuscripts

The dissertation is based on the following three manuscripts:

I. **Steigleder, J.,** Buhr, L., Ehm, J. H., Gawrilow, C., & von Suchodoletz, A. (2023). Changes in subjective stress experiences and self-efficacy beliefs of preschool teachers in Germany: A longitudinal study during 12 months of the COVID-19 pandemic. *Teaching and Teacher Education, 124,* 104015. https://doi.org/10.1016/j.tate.2023.104015

II. **Steigleder, J.**, Buhr, L., Ehm, J. H., Gawrilow, C., & von Suchodoletz, A. (2025). Pandemic-related threats and well-being: A longitudinal study of preschool teachers in Germany during the COVID-19 pandemic. *Early Childhood Research Quarterly*, *70*, 320-333. https://doi.org/10.1016/j.ecresq.2024.11.001

III. **Steigleder, J.,** Gawrilow, C., & von Suchodoletz, A. (2024). *Alltagsbewältigung in der Krise: Auswirkungen der COVID-19-Pandemie auf die Arbeit von Kitaleitungen. Qualitative Studie* [Coping with everyday life in times of crisis: Effects of the COVID-19 pandemic on ECEC leaders. A qualitative Study]. Department of Psychology, University of Tübingen. [Unpublished manuscript]

# 1. General Introduction

Occupational science increasingly highlights how work-related demands shape well-being, performance, and health. During global crises such as the COVID-19 pandemic, early childhood education and care (ECEC) employees have emerged as a societally indispensable yet occupationally vulnerable group. Their well-being affects not only their own health but also the quality of care and education provided to children (Al-Adwan & Al-Khayat, 2017; Cumming, 2017; Rudow & Fischer, 2023; Schreyer et al., 2015; Spieß & Westermaier, 2016; Whitebook & Sakai, 2003). The pandemic introduced new stressors while amplifying long-standing structural challenges (Anders, 2021; Berger et al., 2022; Keleynikov et al., 2022). These challenges became particularly visible in the lived experiences of ECEC professionals, as illustrated by an ECEC leader interviewed in the qualitative part of this dissertation. Looking at the pandemic, she described her impressions as follows:

> The current situation affects everyone emotionally – it's burdensome for colleagues, for parents, for the children. We notice that. The children are different, their behavior is different, they're no longer - not as free, everything feels more subdued. Colleagues are afraid of COVID-19, that's clear, it's easy to get. (Own translation; see original quote in Footnote[*])

This statement not only conveys the emotional impact of the pandemic on children and professionals alike but also points to the broader psychosocial climate in ECEC centers during this period. It is further complemented by economic concerns raised in the same interview:

> And then there are economic fears, because for a long time we didn't know who would be put on short-time work, for whom it would be financially difficult. We have single mothers here, we have people who are already on low wages or have children who are studying – and that all takes its toll on the psyche somewhere. (Own translation; see original quote in Footnote[*])

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[*] **Original quote (German):**
„Also die aktuelle Situation wirkt sich insofern aus, dass Corona menschlich schonmal mit jedem etwas gemacht hat hier, emotional belastend ist für die Kollegen, für die Eltern, für die Kinder. Das merken wir. Die Kinder sind anders, die sind vom Verhalten her anders, die sind nicht mehr – nicht mehr so frei, es ist alles gedrückter. Die Kollegen haben Angst, das ist klar, vor Covid-19, das ist einfach zu kriegen."

[*] „...dann auch wirtschaftliche Ängste, weil wir lange nicht wussten, wer muss in Kurzarbeit, für wen wird es finanziell eng. Wir haben hier Alleinerziehende Mütter, wir haben Leute, die die – wo der Verdienst eh schon gering ist oder studierende Kinder da sind und das das schlägt alles so auf die die Psyche irgendwo drauf."

These subjective experiences, drawn directly from the empirical data of this dissertation, highlight the complexity of pandemic-related loads. They exemplify how situational demands emerged at multiple levels – emotional, social, and economic – and how they were perceived and internalized by professionals in the field. Despite the visibility of such burdens, existing research often fails to capture these nuanced and temporally dynamic experiences. Most studies rely on cross-sectional data and fail to differentiate between intraindividual change and interindividual variability (Keleynikov et al., 2022; Kwon et al., 2022; Oeltjendiers et al., 2021). Where longitudinal designs exist, they tend to focus on macro-level indicators such as institutional capacity or infection rates rather than on subjective experiences of stress and coping in ECEC professionals[1] (Kuger et al., 2022).

To address this gap, this dissertation investigates how pandemic-related demands ("loads") developed over time and how they affected psychological outcomes ("load reactions"). Drawing on the *Belastungs-Ressourcen-Beanspruchungs* (BRB) model (Rudow, 2015; Rudow, 2017), it conceptualizes pandemic-related situational stressors as occupational loads and examines their impact on well-being and mental strain, as well as the potential buffering role of personal resources. Three studies form the empirical foundation of this dissertation. Two longitudinal studies with preschool teachers employed repeated online assessments to investigate monthly fluctuations and associations between perceived loads, load reactions, and personal resources. The third study applied qualitative Grounded Theory methodology (Corbin & Strauss, 2014) to explore perceived loads among ECEC leaders[2] across three levels: institutional (e.g., administrative challenges), interactional (e.g., conflicts with staff, families), and leadership level (e.g., decision-making, emotional responsibility).

The overarching aims of this dissertation are threefold: First, to investigate how preschool teachers' perceived loads and reactions evolved over time, distinguishing intraindividual change from interindividual variability, and relating these changes to COVID-19 activity. Second, to

[1] **ECEC professionals:** Refers to individuals whose professional activity involves education and care enrolled in an ECEC setting. The definition does not depend on the qualification held by the ECEC staff and may include teachers, educators, assistants or staff working with individual children, among other categories (OECD, 2021).

[2] **ECEC leader**: Refers to the person with the most responsibility for the administrative, managerial and/or pedagogical leadership at the ECEC center. As part of the leadership role, center leaders may be responsible for the monitoring of children, the supervision of other staff, contact with parents and guardians, and/or the planning, preparation and carrying out of the pedagogical work in the centre. Center leaders may also spend part of their time working with the children.

investigate how specific pandemic-related loads (e.g., infection, economic threats) affect load reactions, particularly well-being and mental strain, while accounting for temporal dynamics. Third, to investigate the role of personal resources, such as self-efficacy and emotion regulation strategies (e.g., cognitive reappraisal, expressive suppression), in mitigating these effects.

By integrating longitudinal data with qualitative insights, this dissertation offers a comprehensive, multilevel and temporally sensitive understanding of occupational strain among ECEC professionals during the pandemic. It contributes to theory-building within occupational health psychology and provides a foundation for targeted interventions that support resilience and mental health in the ECEC sector – both during crises and in everyday professional life.

Following this general introduction, Chapter 2 outlines the theoretical and empirical background, with a particular focus on the BRB model as a framework for understanding loads, load reactions, and resources in the context of ECEC during the COVID-19 pandemic. Chapter 3 develops the central research aims and hypotheses that guide the empirical work. Chapter 4 presents the three empirical studies conducted in this dissertation: two quantitative longitudinal studies with preschool teachers (Studies 1 and 2), and one qualitative interview study with ECEC leaders (Study 3). Chapter 5 offers an integrated discussion of the main findings, addressing theoretical, methodological, and limitations as well as practical implications. Finally, Chapter 6 concludes the dissertation with a summary of the key insights and directions for future research and practice.

# 2. Theoretical and Empirical Background

Germany is currently experiencing an unprecedented demand for ECEC with 3.7 million children currently enrolled in institutional care (Autorengruppe Fachkräftebarometer, 2021). Since 2006, the number of ECEC professionals has nearly doubled, underscoring the growing societal and economic importance of this occupational group (Autorengruppe Fachkräftebarometer, 2023). This expansion not only reflects the immense societal need for day care services but has also led to a substantial increase in staffing requirements. ECEC professionals play a central role in the German education system, not only fulfilling a childcare function but also serving an important economic role by enabling parents to return to work or advance their careers (Rudow & Fischer, 2023). In both political and academic discourse, the systemic relevance and complexity of ECEC work have gained increasing recognition (Rudow & Fischer, 2023). As a result, the occupational health of ECEC staff has become a critical issue. In light of this growing societal and professional attention, the following section contextualizes the specific challenges that ECEC professionals faced during the COVID-19 pandemic – a crisis that acted as a magnifying lens for pre-existing structural vulnerabilities.

Although educational research offers numerous studies on the health, well-being, and stress of teachers in schools, the study of health and stress among ECEC professionals remains a relatively young research area that has received little attention in the past (Hacker et al., 2020; Püttmann & Rudow, 2020). Yet, this group faces diverse and complex responsibilities, under often demanding and unstable working conditions. These working conditions contribute to physical, cognitive, and socio-emotional strain, which manifest in increased sick leave, absenteeism, and presenteeism. In turn, this undermines pedagogical quality and places sustained pressure on the entire ECEC system (Rudow & Fischer, 2023).

Against this backdrop, the COVID-19 pandemic represents a unique and intensifying stressor for the ECEC sector. Although its impact on the education system has received increasing attention, specific consequences for ECEC professionals remain insufficiently understood. It is plausible that pandemic-related changes in workload and work conditions were accompanied by shifts in employees' experiences, with implications for their well-being and mental health. To explore this dynamic, this dissertation investigates how different phases of the pandemic were reflected in ECEC professionals' perceptions of their occupational situation, and how these

perceptions relate to one another over time. To do so, it is essential to first understand the temporal structure and context of the pandemic in Germany. The following section therefore outlines the COVID-19 pandemic's progression and the varying intensity of COVID-19-related restrictions, providing the necessary background for interpreting shifts in perceived loads and load reactions among ECEC professionals.

## 2.1. COVID-19 Pandemic

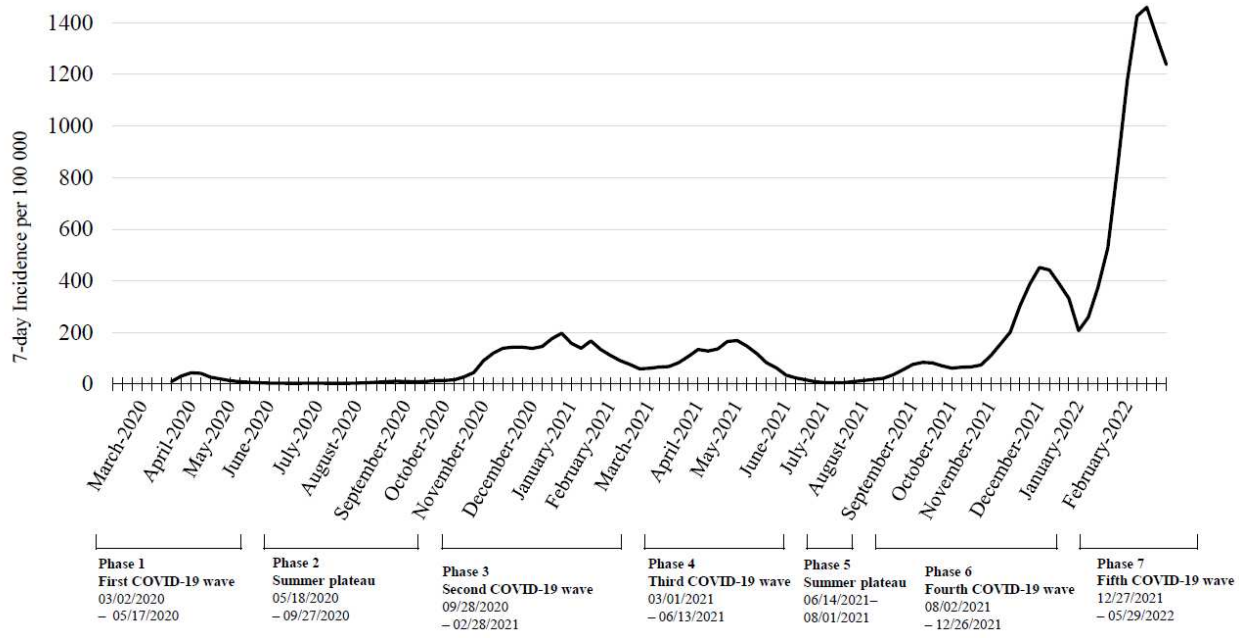
The outbreak of the COVID-19 pandemic in spring 2020 and the measures taken to contain, triggered a societal state of emergency with far-reaching consequences for children, families, and ECEC institutions (Anders, 2021). The pandemic introduced a range of new challenges and disruptions to the ECEC system, placing substantial additional demands on ECEC professionals (Anders, 2021). Empirical studies confirm that ECEC professionals experienced increased stress and psychological strain during this period (Berger et al., 2022; Keleynikov et al., 2022). All employees in ECEC, including those in leadership positions such as ECEC leaders, were required to engage in crisis management on multiple levels during the COVID-19 pandemic. At the institutional level, they were responsible for organizing closures, coordinating emergency childcare, and ensuring compliance with constantly evolving public health regulations (Strehmel, 2023). Simultaneously, on the interactional level, maintaining communication with families – often relying on digital tools – posed an additional challenge (Strehmel, 2023). These substantial multifaceted demands not only emerged as a direct consequence of the pandemic; rather, they exacerbated pre-existing structural demands and stressors within the ECEC profession.

To understand these developments in their temporal context, the next section outlines the pandemic's timeline and its evolving contextual circumstances. The retrospective phase classification developed by the Robert Koch Institute (RKI[3]) offers a valuable framework for capturing the dynamic progression of the pandemic, distinguishing between periods of high and low COVID-19 activity. Figure 1 presents nationwide incidence rates – that is, the number of newly reported COVID-19 cases per 100,000 inhabitants over a specified time period (RKI, 2022) – and retrospectively maps key pandemic-related events in Germany from March 2020 to May 2022, as determined by Tolksdorf et al. (2022) and Schilling et al. (2022).

[3] The **Robert Koch Institute (RKI)** is the leading public health institute in Germany, responsible for monitoring, assessing, and controlling infectious diseases. During the COVID-19 pandemic, the RKI played a crucial role in providing guidance, conducting research, and disseminating information to the public and healthcare professionals.

**Figure 1**

*Retrospective Phase Classification of COVID-19 in Germany*




*Note.* A COVID-19 wave refers to a period of high COVID-19 activity characterized by a rapid increase in incidence rates. The figure is adapted from Steigleder et al. (2025).

The first wave of COVID-19 marks the beginning of Phase 1. Following a nationwide lockdown and comprehensive restrictions at the federal level – including closures of schools and preschools – the number of infections declined. In Phase 2, the summer plateau of 2020, infection rates remained very low across all German states, and most restrictions were lifted (Schilling et al., 2022). Phase 3 began in late August 2020 with a renewed surge in infections, marking the second COVID-19 wave. By the end of October, case numbers had risen sharply, prompting a partial lockdown and the reintroduction of restrictions. In December 2020, still within Phase 3, stricter measures such as nighttime curfews were implemented. Despite these efforts, infection rates remained high, peaking in January before gradually declining until the end of February.

Phase 4 began in early March 2021 with the third wave, marked by another spike in infections. During the summer of 2021, cases stagnated for an extended period, marking Phase 5 with another summer plateau. However, Phase 6 led to a further increase of COVID-19 cases, leading to a second peak in late November/early December 2021, followed by a steady decline. Toward the end of 2021, the transition to Phase 7 – corresponding to the fourth and fifth waves – was almost continuous. This phase brought the highest infection rates of the pandemic to date.

Overall, Phases 2 and 5 can be described as relatively "lighter or improved" periods, characterized by low infection rates and relaxed restrictions. In contrast, Phases 3, 4, 6, and 7 represent more "challenging" periods, defined by rising cases, renewed restrictions, resulting in persistent challenges. However, the timing and scope of restrictions varied across states, regions, and institutions in Germany. To account for this variation, Table 1 provides a general overview of pandemic-related political measures and developments in the ECEC sector, aligned with the RKI phase classification.

**Table 1**

*Chronology of COVID-19-Related Measures in the German ECEC System*

| COVID-19 Phase | ECEC Impact and Preschool Teacher Experience |
|---|---|
| **Phase 1**<br>First COVID-19 wave<br>(03/02/20 – 05/17/20) | – First nationwide lockdown; closures of preschools and schools [a]<br>– Emergency care limited to children of critical infrastructure workers [a]<br>– Child attendance rates between 10–30% [a]<br>– Significant staff shortages reported [a, b] |
| **Phase 2**<br>Summer plateau 2020<br>(05/18/20 – 09/27/20) | – Gradual lifting of restrictions; preschools reopened under strict hygiene and distancing rules [a]<br>– Up to 8% of staff unable to work in direct contact due to infection risk or high-risk status [a] |
| **Phase 3**<br>Second COVID-19 wave<br>(09/28/20 – 02/28/21) | – Partial lockdown and reclosure of preschools (emergency care only) [a]<br>– Repeated extensions of restrictions; changes in practice, changes in group concepts [a]<br>– 20% of preschool teachers unable to work; 40% of ECEC leaders reported fear of infection [a, c]<br>– Ongoing staff shortages hindered implementation of prevention measures [a] |
| **Phase 4**<br>Third COVID-19 wave<br>(03/01/21 – 06/13/21) | – Regional incidence rule introduced; preschools reopened<br>– Preschool occupancy increased; preventive measures eased, followed by another nationwide lockdown<br>– 43% of preschool teachers reported infection concerns [a] |
| **Phase 5**<br>Summer plateau 2021<br>(06/14/21 – 08/01/21) | – Preschools remained open under pandemic conditions; some measures lifted [d]<br>– 17% of teachers reported infection concerns [a] |

| | |
|---|---|
| **Phase 6**<br>Fourth COVID-19 wave<br>(08/02/21 – 12/26/21) | – Preventive measures reintroduced (e.g., group separation, testing, FFP2 masks) [a]<br>– Closures occurred at group level only [a]<br>– 7% of staff could not work in direct contact with children [a] |
| **Phase 7**<br>Fifth COVID-19 wave<br>(12/27/21 – 05/29/2022) | – Preschools remained open with protective measures and regular testing [e]<br>– Staff unavailability rose to 21%, partly due to other respiratory illnesses [a]<br>– 50% of ECEC leaders reported no fear of infection [a] |

*Note.* The table is adapted from Steigleder et al. (2025). [a] Kuger et al. (2022), Autorengruppe Corona-KiTa-Studie ([b] 2020, [c] 2021, [d] 2022), [e] Neuberger et al. (2022)

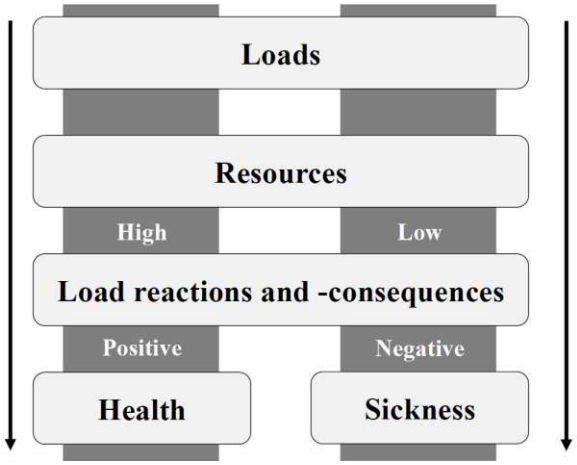
Taken together, the fluctuating infection rates and corresponding political measures had a marked impact on both the functioning of the ECEC system and the psychological resilience of ECEC staff. These contextual factors are essential for understanding the psychological and emotional stress preschool teachers faced during the pandemic. The following section introduces the BRB model (Rudow & Fischer, 2023) as the theoretical foundation for analyzing how such specific demands, their consequences, and available resources interacted during the pandemic, and how they may have shaped the occupational experiences of ECEC professionals.

### 2.2. Theoretical framework BRB Model

The *Belastungs-Ressourcen-Beanspruchungs (BRB) model* has proven to be a valuable framework for examining workload and health among teachers and has since been adapted and further developed for research in educational contexts (Rudow, 2015; Rudow, 2017). It comprises three core components: *Loads [Belastung]*, which elicit *load reactions* or *consequences [Beanspruchungsreaktion oder -konsequenz]*, and *resources [Ressourcen]*, which can mitigate or moderate these effects. These components are further differentiated into specific load categories and factors, both positive and negative reactions and consequences, as well as a range of personal and contextual resources (see Figure 2).

**Figure 2**

*BRB Model according to Rudow (2015)*




Importantly, the BRB model posits that loads and their consequences are inherently linked to occupational activities, as the performance of work tasks involves encountering both objectively measurable demands and subjective performance requirements – such as those related to age, professional experience, or gender (Rudow & Fischer, 2023). This embeddedness in the work context distinguishes the model as especially applicable to pedagogical professions. Moreover, the model is empirically well-founded; its individual components have been validated in numerous studies in both school-based and early childhood education settings (DJI & WiFF 2020; Rudow, 2015; Rudow, 2017).

In comparison, while the Job Demands–Resources (JD-R) model (Demerouti et al., 2001), offers a broad, generalizable framework across various occupations, the BRB model provides a more domain-specific and operationalized approach. It is particularly tailored to the psychological and contextual dynamics of pedagogical professions. In what follows, the BRB model's key components are outlined and linked to the core constructs of this dissertation, thereby laying the foundation for the subsequent empirical investigations.

### 2.3. Loads characterized by the work of preschool teachers

To begin, it is necessary to clarify the terminology used when describing occupational demands. In medical, psychological, and educational research, terms such as stress, strain, and stressors are often used inconsistently and carry negative connotations. By contrast, occupational

science adopts the more neutral term *load*, referring to the demands inevitably encountered in the execution of work tasks (Schlick et al., 2018).

Following this approach, the BRB model defines *loads* as encompassing the full range of psychological, social, physical, and behavioral effects related to occupational demands. These include both objective loads, which exist independently of the individual, and subjective loads, referring to how individuals perceive and are affected by these demands in their work context – ultimately leading to *load reactions or consequences* (Rudow, 1995; Rudow & Fischer, 2023). Based on this framework, the professional activities of ECEC staff can be analyzed in terms of discrete load categories. Rudow (2017) classifies these into task-related or condition-related loads. As summarized in Table 2, the five categories provide a structured basis for identifying and evaluating occupational demands in ECEC settings.

**Table 2**

*Load Categories and Factors according to Rudow (2017)*

| Load categories | Loads |
|---|---|
| Work tasks and organization | – Work tasks/ working hours |
| | – Pedagogical concept |
| | – Staffing & staff-child ratio |
| | – Group size |
| | – Physical requirements |
| | – Training and development |
| Work environment and equipment | – Room size/equipment |
| | – Noise level |
| | – Work/play materials |
| | – Risk of infection |
| Social and cultural conditions | – Reforms, laws |
| | – Professional status/ image |
| | – Reputation/recognition in society |
| | – Education plans |
| | – Employment agreements / Wage agreements |
| Social interaction | – Social structure of the children |
| | – Team size/ team structure/ team climate |
| | – Management style/ working atmosphere |
| | – Educational views/communication styles |
| Emotional work | – Regulation of own feelings/ showing socially desirable feelings and emotional expressions |

The profound disruptions brought by the COVID-19 pandemic underscored and, in many cases, intensified these existing load categories by fundamentally altering working conditions. The rapidly shifting infection dynamics (see section 2.1) triggered repeated transitions between institutional closures and reopenings. These shifts – often driven by evolving infection prevention policies – imposed substantial organizational and administrative burdens on ECEC professionals. At the same time, they contributed to increased negative load reactions such as psychological stress and mental strain, as evidenced by a growing body of empirical studies (Autorengruppe Corona-KiTa-Studie, 2020, 2021; Berger et al., 2022; Blum & Dobrotić, 2021; Keleynikov et al., 2022).In addition to intensifying known loads, the pandemic brought new demands into focus. Among these, the COVID-19 infection threat emerged as a particularly salient factor, as described in more detail.

### *2.3.1. COVID-19 infection threat*

As already stated, preschool teachers' work inherently involves close physical interaction with children, placing them at increased risk of infection. This risk was particularly acute during the early stages of the COVID-19 pandemic, when the role of children in virus transmission remained uncertain (Neuberger et al., 2022). Drawing on the psychometric paradigm, risk perception is shaped by two central dimensions: dread – reflecting uncontrollability and catastrophic potential, and unknown risk – relating to the invisibility or unfamiliarity of the hazard (Peters & Slovic, 1996; Siegrist et al., 2005). Within the BRB Model, such risk perceptions – referred to in this work as the *COVID-19 infection threat* – are conceptualized as work environment-specific loads. The ECEC setting itself – with its structural constraints and high interaction density – functioned as a primary source of infection-related strain.

Empirical research supports this conceptualization: Risk perception is influenced by both cognitive appraisals and affective responses, which in turn affect psychological well-being (Leppin & Aro, 2009; Loewenstein et al., 2001). Previous pandemic studies have shown that perceived health threats evoke strong emotional responses such as fear, anxiety, and psychological stress, particularly in the context of daily workplace exposure (Beames et al., 2021; Yang & Chu, 2018). Among ECEC professionals, concern about contracting the virus through contact with children significantly increased anxiety (Keleynikov et al., 2022; Kuger et al., 2022). Furthermore, fear of transmitting the virus to family members or vulnerable individuals contributed to an additional layer of psychological distress (Li et al., 2022). These findings highlight how COVID-19 infection

threat, as a pandemic-specific load, manifested through both perceived risk and noticeable emotional strain in ECEC settings.

### *2.3.2. Economic threat*

Complementing the infection-related perspective, the pandemic also intensified economic loads experienced by ECEC professionals. Despite the growing societal recognition of early education and the increasing demand for qualified staff, full-time preschool teachers in Germany consistently earn below the national average (Hipp et al., 2017; Schreyer et al., 2015). This economic disparity became even more salient during the COVID-19 pandemic, when economic instability constrained institutional budgets, and operational disruptions heightened concerns regarding job security and long-term financial sustainability. Within this dissertation, such experiences are conceptualized as *economic threat* – categorized in accordance with the BRB model as a social and cultural condition-specific load (Al-Adwan & Al-Khayat, 2017; Rudow, 2017). Even prior to the COVID-19 pandemic, inadequate pay and financial strain represented a persistent stressor for the ECEC workforce in Germany (Schreyer et al., 2015). During the pandemic, factors such as lower child enrollment, reduced hours, and decreased institutional funding further exacerbated financial instability (Kwon et al., 2022; Swigonski et al., 2021).

Consequently, empirical studies have consistently demonstrated the adverse effects of financial load on ECEC professionals, linking it to elevated stress levels and an increased risk of workforce attrition. Moreover, economic threat has prior been associated with higher rates of burnout, a decline in developmentally appropriate pedagogical practices, and overall reductions in both work quality and instructional effectiveness (Al-Adwan & Al-Khayat, 2017; Cumming, 2017; Schreyer et al., 2015; Spieß & Westermaier, 2016; Whitebook & Sakai, 2003).

### *2.3.3. Specific loads of ECEC leaders*

In addition to the experiences of frontline staff, ECEC leaders encountered distinct and complex loads during the pandemic They played a central role in managing staff and maintaining operations under rapidly changing and often restrictive conditions (Kuger et al., 2022; Strehmel, 2023). Their position required comprehensive crisis management and led to the emergence of COVID-19-related loads at three distinct levels: institutional, interactional, and leadership level.

At the *institutional level*, ECEC leaders were responsible for navigating center closures, emergency care phases, and restricted operations, primarily by implementing and enforcing

daycare regulations and hygiene measures. These responsibilities introduced substantial logistical and organizational loads, as leaders had to ensure compliance with frequently updated policies while safeguarding the health and safety of staff and children. At the *interactional level*, the adoption of digital communication tools in response to contact restrictions presented additional challenges. ECEC leaders had to establish effective communication structures, mediate between stakeholders with diverging expectations, and respond to the emotional needs of staff and families (Strehmel, 2023). At the *leadership level*, they encountered increased administrative burdens and heightened stress, while simultaneously striving to maintain pedagogical quality despite ongoing operational constraints (Kuger et al., 2022).

Taken together, these responsibilities resulted in significant emotional and organizational strain that likely impacted the overall quality of care (Meyer et al., 2021). The complexity of these loads underscores the multifaceted demands placed on ECEC leaders during the pandemic. Nevertheless, a comprehensive understanding of the full scope of these loads remains limited, as empirical research on leadership-specific loads in this context is still scarce. This highlights a critical research gap: Understanding the unique challenges faced by ECEC leaders is essential for designing effective support structures and safeguarding care quality during future crises.

### 2.4. Load reactions and consequences

Referring to the BRB Model, the impact of loads inevitably triggers an immediate response from the individual, which can be categorized into *load reactions* (short-term responses) and *load consequences* (persistent or long-lasting psychological or physical effects). These responses can be more or less reversible and are further classified into positive and negative reactions and consequences, primarily occurring during the performance of work tasks (see Figure 2 and Table 2). While negative reactions may impair perceptions, well-being, performance, and mental health, positive responses may enhance these aspects and contribute to better overall functioning and more satisfying work experiences (Rudow, 2017; Rudow & Fischer, 2023).

The nature and severity of load reactions and consequences depend not only on the characteristics of the load but also on individual abilities, skills, personal resources, and current health status. Thus, objectively identical loads can lead to different load reactions and consequences between individuals, and the same load can evoke varying responses within the same individual at different times (Bartholdt & Schütz, 2010). This variability highlights the importance of examining how individuals perceive and experience load reactions and consequences, as these

perceptions play a pivotal role in shaping both immediate and long-term responses to work-related loads. This work focuses on three specific types of load reactions and consequences: subjective stress experience, affective well-being, and COVID-19-related mental strain.

### *2.4.1. Subjective stress experience*

The concept of stress has been widely theorized in psychological research (Curbow et al., 2000), with a foundational contribution from Lazarus' cognitive-transactional stress model (Lazarus, 1999; Lazarus & Folkman, 1984). This model conceptualizes stress as a dynamic interaction between the individual and their environment, mediated by cognitive appraisal processes. Individuals assess whether a situation is personally relevant, threatening, and manageable – a process central to the stress response (Hemming, 2015). Building on this, the BRB model defines *subjective stress experience* as an immediate negative reaction to load, often marked by emotional tension and inner unrest. This reaction occurs particularly when individuals perceive threats to their personal needs, goals, or values. Emotional states such as tension, restlessness, and anxiety are common, especially when there is a perceived mismatch between occupational demands and an individual's abilities and resources (Rudow & Fischer, 2023).

In the context of preschool teaching, these theoretical models offer a perspective for examining the daily work demands of preschool teachers. Preschool teachers face numerous stressors, including understaffing, illness, administrative burdens, time pressures, and high expectations from parents. Research consistently demonstrates that these stressors significantly increase stress levels among teachers, which in turn adversely affect their professional performance (Berger et al., 2001; Curbow et al., 2000; Gewerkschaft Erziehung und Wissenschaft, 2007; Jungbauer & Ehlen, 2015). S Particularly, the psychological load stemming from stress, emotional exhaustion, and depression has been linked to negative outcomes, such as diminished teacher responsiveness and overall performance (Buettner et al., 2016; Jennings & Greenberg, 2009).

Moreover, stress negatively impacts teachers' caregiving behaviors and the teacher-child relationship, leading to poorer caregiving practices and strained interactions with children, which in turn affects the overall quality of care provided (de Schipper et al., 2009; Zinsser et al., 2013). These findings emphasize the need to consider the interplay between environmental loads, individual coping resources, and resulting load reactions. They also highlight the necessity for research focused on ECEC settings to improve preschool teacher well-being and enhance the quality of care for children.

### *2.4.2. Subjective well-being*

Subjective well-being is typically understood as comprising two components: affective well-being and cognitive well-being (Diener et al., 1995; Diener et al., 1999). Cognitive well-being refers to evaluative beliefs about one's life, including overall life satisfaction and satisfaction in specific life domains. *Affective well-being* reflects the balance of positive and negative emotions experienced daily, typically measured by positive and negative affect (Schimmack, 2008). The work environment – especially in professions with high emotional and relational demands – plays a central role in shaping both components. In early childhood education, affective well-being is particularly sensitive to work-related loads. Conditions such as workplace climate, time pressure, or team dynamics significantly affect preschool teachers' affective states (Whitaker et al., 2015). Lower levels of affective well-being are associated with reduced caregiving responsiveness, negatively affecting teacher-child interactions and care quality (Buettner et al., 2016).

The COVID-19 pandemic introduced unprecedented loads that compounded existing challenges for preschool teachers. Increased workloads, economic insecurities, and health concerns led to phase-specific fluctuations in their well-being, disrupted work-life balance and exacerbated stress levels (Berger et al., 2022; Swigonski et al., 2021). COVID-19-specific stressors, such as fear of infection and heightened risk perceptions, also contributed to significant declines in well-being (Han et al., 2021). These findings align with research from previous pandemics, such as H1N1, which showed that uncertainty and perceived threats negatively affected well-being (Prati et al., 2011). The cognitive-transactional stress model (Lazarus & Folkman, 1984) and the BRB model (Rudow & Fischer, 2023) therefore offer valuable frameworks for understanding how these stressors reduced preschool teachers' coping capacities and, ultimately, their subjective well-being.

### *2.4.3. Mental strain*

As highlighted above, subjective stress experience and well-being fluctuate in response to varying work demands. When these demands become persistent or overwhelming, they may give rise to mental strain, defined as sustained psychological pressure, characterized by symptoms such as anxiety, irritability, exhaustion, or cynicism (Bakker et al., 2003). In this study, mental strain is conceptualized more specifically as *COVID-19-related mental strain*, referring to the psychological burden associated with the unique and prolonged stressors of the pandemic.

Recent studies indicate that COVID-19-related loads – such as infection risks, financial concerns, and disruptions to routines – substantially contributed to increases in mental strain among

early childhood education professionals (Berger et al., 2022; Keleynikov et al., 2022; Swigonski et al., 2021). Notably, these findings suggest that the pandemic triggered not only acute psychological responses but also more persistent changes in mental health. The dynamic nature of mental strain underlines the importance of examining how novel and ongoing loads interact with individual and contextual resources, and how these interactions shape the well-being of preschool teachers over time.

## 2.5. Resources

Building upon the previous discussion of mental strain, the BRB Model emphasizes that resources are crucial in shaping how individuals experience and respond to loads. They act as moderators, mediators, or sequential elements between loads, load reactions, health outcomes, and work performance. Adequate resources, whether personal or work-related, can reduce or even prevent negative load reactions and their consequences. In contrast, accessible resources may intensify psychological strain and impair both well-being and performance (Rudow, 2017; Rudow & Fischer, 2023).

To provide a more nuanced understanding, resources can be broadly categorized into external (e.g., work tasks, institutional structures) and internal (e.g., competencies, beliefs, personal attitudes). Internal resources are particularly relevant, as they reflect the psychological and physical capacities that shape how individuals cope with external demands. In line with this internal resources are key to promoting resilience and enhancing (work) performance (Xanthopoulou et al., 2007). In this dissertation, the focus lies specifically on two internal resources that are central to the BRB framework: self-efficacy beliefs and emotion regulation strategies.

### *2.5.1. Self-efficacy beliefs*

As a first internal resource, *self-efficacy beliefs* (SEB) represent a core psychological capacity for managing loads and maintaining well-being. Grounded in Bandura's social cognitive theory, SEB refer to individuals' beliefs in their ability to organize and execute actions required to achieve specific goals (Bandura, 1997). Research to date has underscored the importance of SEB in the teaching profession, demonstrating their link to both professional effectiveness and mental health (Bach, 2022; Skaalvik & Skaalvik, 2007; Tschannen-Moran & Hoy, 2007; von Suchodoletz et al., 2018). However, studies specifically focusing on ECEC professionals – especially within German-speaking countries – are still limited. Likewise, standardized tools for assessing SEB in this population are still at an early stage (Wolstein et al., 2021).

According to Bandura (1997), SEB are shaped by four key sources: mastery experiences, vicarious experiences, and verbal persuasion. Among these, mastery experiences – perceiving one's performance as successful – are considered most influential, as they foster confidence in future performance (Bong & Skaalvik, 2003; Pajares, 1997). Vicarious experiences, such as observing others successfully completing tasks, further contribute to shaping beliefs in one's own abilities. Additionally, verbal persuasion, encompassing feedback and discussions about one's own or others' experiences, can also strengthen SEB. In this context, collegial exchange plays a pivotal role: opportunities to observe others, engage in collaborative activities, and receive meaningful feedback from colleagues or parents have been shown to enhance SEB (Guo et al., 2011; Henson, 2001; Klassen et al., 2011; Mulholland & Wallace, 2001; Tschannen-Moran & Hoy, 2007).

SEB are influenced by both personal and contextual factors, leading to interindividual differences. For instance, some individuals have higher self-efficacy beliefs than others (Skaalvik & Skaalvik, 2007). Research in teacher education further shows that SEB is not static but fluctuates in response to situational demands or loads (Zee et al., 2016). While SEB exhibits some trait-like stability, it is highly context-dependent, varying across job domains and specific challenges (Bandura, 1997; Tschannen-Moran et al., 1998). Insights from teacher research are increasingly being applied to preschool teachers, suggesting that their self-efficacy beliefs are shaped by a dynamic interplay of enduring loads and situational factors.

In the context of the BRB model, SEB serve as a protective internal resource that can mitigate the effects of loads and buffer against mental strain. High SEB has been associated with lower perceived stress and more adaptive coping strategies (Smidt et al., 2017), whereas low SEB is linked to increased vulnerability to stress and reduced resilience in demanding settings (Bandura, 1986; Heuven et al., 2006; Schwarzer & Hallum, 2008). Therefore, exploring how pandemic-related disruptions may have affected key sources of SEB in ECEC professionals is essential for understanding their capacity to manage load reactions over time.

### *2.5.2. Emotion regulation strategies*

In addition to SEB, emotion regulation (ER) strategies represent another central internal resource within the BRB model. When individuals experience a load reaction, or "affective response," ER strategies play a critical role in determining whether emotional reactions are reduced, maintained, or intensified (Gross, 2013). ER involves modifying emotions, emotional responses, or the situations eliciting them to effectively adapt to environmental demands (Gross,

1998). Gross (2013) identifies two identifies two primary ER strategies: *cognitive reappraisal* and *expressive suppression*. Cognitive reappraisal, an antecedent-focused strategy, involves reframing or reevaluating a situation before it triggers an emotional response, while expressive suppression, a response-focused strategy, seeks to suppress emotional expressions after the emotion has been experienced.

These strategies are not merely descriptive but have functional implications: Cognitive reappraisal is linked to beneficial outcomes, including enhanced well-being, better interpersonal functioning, and reduced stress. In contrast, expressive suppression is associated with negative mental health effects, such as heightened negative affect and impaired interpersonal functioning (Gross & John, 2003; Han et al., 2020; Yin et al., 2016). The choice of emotion regulation strategy directly influences load reactions. From the BRB perspective, effective emotion regulation strengthens coping and reduces the negative impact of load reactions on well-being (Lazarus & Folkman, 1984).

Traditionally seen as a stable trait, ER is now recognized as a dynamic process shaped by situational demands, context, and personal goals. Recent research underscores the importance of context in influencing ER, revealing how individuals adapt their strategies to meet immediate challenges and promote adaptive functioning (Gross, 2014; Wenzel et al., 2022). This shift emphasizes the need to distinguish between ER as a trait and as a state, as strategies can vary significantly across different situations. Daily diary studies provide valuable insight into this intraindividual variability, demonstrating that on days when individuals engage more frequently in cognitive reappraisal, they experience higher levels of positive affect, while increased use of expressive suppression is linked to heightened negative affect (Brans et al., 2013; Brockman et al., 2017). These findings illustrate the critical role of emotion regulation strategies in shaping immediate emotional outcomes and overall well-being.

These insights have led to the concept of ER flexibility – the adaptive capacity to choose context-appropriate strategies (Aldao et al., 2015; Bonanno & Burton, 2013). While stable individual differences exist in the tendency to use certain strategies, research indicates that trait-level patterns do not always align with daily or situational experiences (Nezlek & Kuppens, 2008). Thus, effective emotion regulation is not only about what strategies people prefer but also about how flexibly they apply them in response to dynamic loads such as those posed by the COVID-19 pandemic (Wenzel et al., 2022).

## 3. Summary of Research Aims and Hypotheses

Early childhood professionals, especially ECEC leaders and preschool teachers, faced significant challenges throughout the various phases of the COVID-19 pandemic. While existing research has addressed various aspects of these challenges (Anders, 2021; Keleynikov et al., 2022; Kuger et al., 2022; Kwon et al., 2022; Oeltjendiers et al., 2021), most studies have relied on cross-sectional designs. This limits our understanding of how preschool professionals' experiences fluctuated over time in response to evolving pandemic-related conditions.

Against this backdrop, the present dissertation adopts a longitudinal and multilevel perspective to capture the temporal dynamics of pandemic-related loads, their psychological consequences, and the role of personal resources. Specifically, it introduces repeated online assessments as a methodological innovation to better represent the complex and dynamic nature of preschool professionals' everyday experiences. In doing so, it seeks to both advance empirical research in the ECEC sector and critically assess the strengths and limitations of this approach.

The overarching aim of this dissertation is to investigate how pandemic-related loads – particularly infection threat and economic threat – affected preschool teachers' psychological well-being and mental strain between September 2020 and February 2022. Anchored in the BRB model, the dissertation examines both within-person and between-person variability in these experiences, thereby integrating different levels of analysis. Crucially, the dissertation focuses on the role of internal personal resources – specifically, self-efficacy beliefs and emotion regulation strategies – which may buffer or exacerbate the effects of external loads.

To complement this quantitative perspective, the dissertation also incorporates qualitative data to capture the specific experiences of ECEC leaders. This mixed-methods approach aims to provide a more comprehensive understanding of the pandemic's impact across different hierarchical levels in early childhood education settings.

The first manuscript explores how preschool teachers' subjective stress experiences and self-efficacy beliefs have evolved throughout the various phases of the COVID-19 pandemic. The study aims to identify patterns of change both within individuals and across the entire sample. Additionally, it seeks to determine whether self-efficacy beliefs serve as a protective factor, potentially mitigating the effects of perceived stress, with a particular focus on the interplay between these variables at both the within- and between-person levels. This manuscript provides

fundamental insights into the temporal dynamics of subjective stress experiences and self-efficacy beliefs, viewed from a longitudinal and multidimensional perspective.

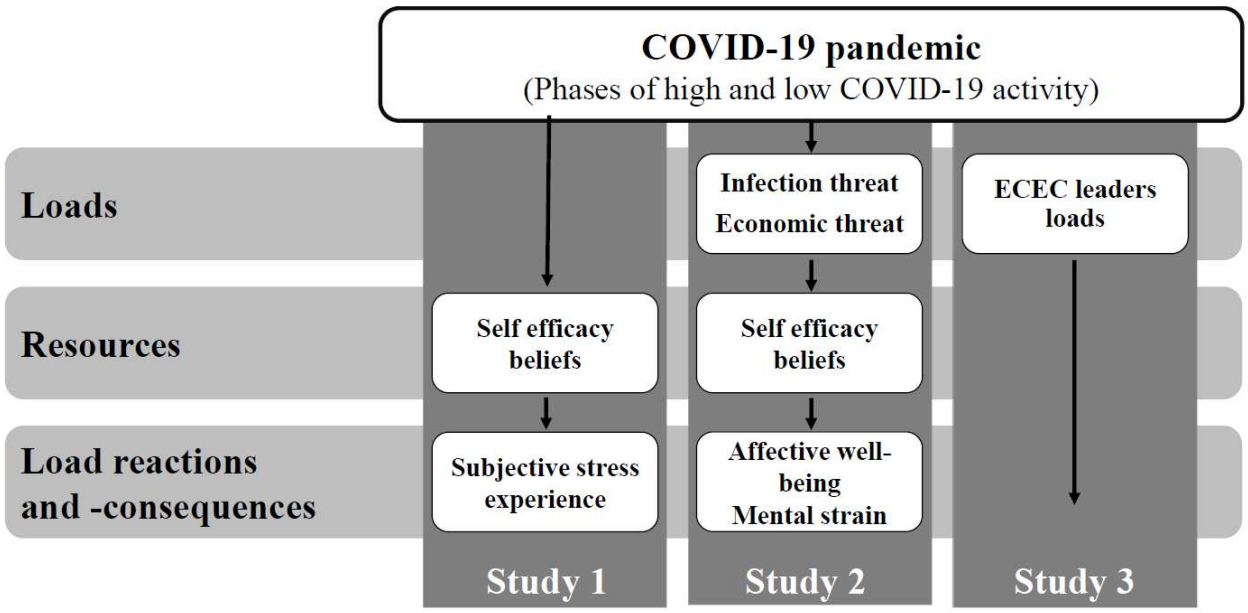
The second manuscript builds on the same initial sample as the first, but with an expanded study design, additional measurement points, and a broader sample, thus extending the scope of research. The first step of the analysis focuses on changes in preschool teachers' perceived loads (i.e., infection threat, economic threat), affective well-being and mental strain, followed by an exploration of the associations between perceived loads and load reactions. Specifically, the manuscript examines the relationships between preschool teachers' perceived loads and their affective well-being, particularly in terms of changes in positive and negative affect. It also investigates the link between perceived loads and mental strain, capturing both monthly fluctuations within individuals and stable differences between individuals. Furthermore, the study explores how emotion regulation strategies, such as cognitive reappraisal and expressive suppression, moderate these associations. By integrating these elements, the manuscript aims to provide a nuanced understanding of how preschool teachers' mental health was shaped by pandemic-related loads.

Finally, the third manuscript shifts the analytical focus to the leadership level by qualitatively exploring the perspectives of ECEC leaders during the pandemic. Using Grounded Theory methodology (Corbin & Strauss, 2014), this study documents the specific institutional, interpersonal, and leadership-related loads experienced by ECEC leaders. This manuscript provides insights into the broader organizational context of early childhood education during a global health crisis and provides the empirical basis for future research and practical interventions.

Taken together, the three manuscripts contribute to a comprehensive understanding of how pandemic-related loads, psychological reactions, and internal resources interact across time and system levels. The integration of longitudinal quantitative data with qualitative insights ensures a nuanced analysis of stress, coping, and resilience among ECEC professionals during a time of global uncertainty.

**Figure 2**

*Conceptual Framework of this Dissertation*




To answer my research questions, I propose the following three hypotheses:

(1) Preschool teachers' perceived loads and load reactions:
   a. vary in accordance with fluctuations in COVID-19 activity, reflecting differences across the pandemic phases (between-person level).
   b. show consistent change rates, indicating similar responses across the different phases of the pandemic (within-person level).
   c. *Explorative:* ECEC leaders report specific loads associated with the COVID-19 pandemic.

(2) Tested in Study 2: Preschool teachers' perceived loads are associated with specific load reactions at both the between- and within-person levels, including changes in affective well-being (e.g., increased negative affect and decreased positive affect) and heightened levels of mental strain in response to perceived loads.

(3) Tested in Study 1 and 2: Preschool teachers' load reactions are shaped by the availability of resources, including:
   a. their self-efficacy beliefs, at both on the between-person and within-person levels.
   b. their average use of emotion regulation strategies, specifically cognitive reappraisal and expressive suppression.

The following chapter provides a summary of the empirical studies that form the foundation of this dissertation (see Appendices B-D). These studies are presented in two peer-reviewed, published manuscripts, as well as one unpublished manuscript. The studies consist of three individual manuscripts that can be read independently, resulting in a certain amount of overlap with the theoretical and empirical background of this dissertation.

# 4. Summary of Manuscripts

## 4.1. Changes in Subjective stress experiences and self-efficacy beliefs (Study 1)

This study collected monthly data between September 2020 and August 2021 to document the consequences of the COVID-19 pandemic for German preschool teachers during different pandemic phases. This longitudinal study investigated how subjective stress experiences and self-efficacy beliefs of preschool teachers ($n$ = 279) change over time and explored associations on the inter- and intraindividual level. We observed phase-specific changes in subjective stress experiences and interindividual differences in change rates, but no systematic increase across the entire study period. Results also highlight self-efficacy beliefs as a resource for preschool teachers, which should be strengthened to better face stress experiences.

This abstract, as well as the full version of the manuscript, can be retrieved from:

**Steigleder, J.,** Buhr, L., Ehm, J. H., Gawrilow, C., & von Suchodoletz, A. (2023). Changes in subjective stress experiences and self-efficacy beliefs of preschool teachers in Germany: A longitudinal study during 12 months of the COVID-19 pandemic. *Teaching and Teacher Education, 124, 104015.* https://doi.org/10.1016/j.tate.2023.104015

### 4.2. Pandemic Threats and Well-Being (Study 2)

Working conditions in the ECEC field changed significantly during the COVID-19 pandemic. To understand how these changes affected preschool teachers, a longitudinal study was conducted in Germany from September 2020 to February 2022, a period that covers different phases of the global health crisis. Multilevel models were used to observe phase-specific changes and to test whether preschool teachers' emotion regulation strategies moderated relationships between COVID-19 infection threat, economic threat, affective well-being, and COVID-19 related mental strain. A total of 388 preschool teachers ($M$ = 37.54 years) participated in the online survey study ($M$ = 4.78 out of max. 16 participations). Results highlighted phases of higher and lower COVID-19 related threat and showed associations between perceived infection and economic threat and affective well-being and COVID-19 related mental strain. Findings indicated that the extent of cognitive reappraisal and expressive suppression moderated the associations between COVID-19 infection threat and positive affect, as well as the association between economic threat and mental strain. Phase-specific changes and differences in change rates were discussed in the context of potential prevention and intervention measures.

This abstract, as well as the full version of the manuscript, can be retrieved from:

**Steigleder, J.**, Buhr, L., Ehm, J. H., Gawrilow, C., & von Suchodoletz, A. (2025). Pandemic-related threats and well-being: A longitudinal study of preschool teachers in Germany during the COVID-19 pandemic. *Early Childhood Research Quarterly*, *70*, 320-333. https://doi.org/10.1016/j.ecresq.2024.11.001

### 4.3. Impact of the COVID-19 pandemic on the work of ECEC leaders (Study 3)

During the COVID-19 pandemic, closures, restricted regular opening, and regulations posed new challenges for preschools. ECEC center leaders played a central role in organizing and maintaining daycare. This study examined the impact of the COVID-19 pandemic on ECEC center leaders. Qualitative interviews ($n$ = 35) were used to examine perceptions at institutional, interactional and leadership level. Findings underscore the multifaceted demands, prompting a reevaluation of their roles in crisis management and the pursuit of enhanced working conditions.

The German version of the abstract, as well as the full version of the manuscript, can be retrieved from:

**Steigleder, J.,** Gawrilow, C., & von Suchodoletz, A. (2024). *Alltagsbewältigung in der Krise: Auswirkungen der COVID-19-Pandemie auf die Arbeit von Kitaleitungen. Qualitative Studie* [Coping with everyday life in times of crisis: Effects of the COVID-19 pandemic on ECEC leaders. A qualitative Study]. Department of Psychology, University of Tübingen. [Unpublished manuscript]

# 5. General Discussion

The end of the COVID-19 pandemic has left many with the impression of a transformative experience, one that is difficult to categorize, narrate chronologically, or break down into individual factors. As a result, reflecting on its impact on the field of ECEC poses a similar challenge. Although several studies have documented the pandemic's effects in Germany over time (Anders, 2021; Kuger et al., 2022; Oeltjendiers et al., 2021; Strehmel, 2023), there remains a critical gap in empirical evidence and longitudinal perspectives on the effects of COVID-19 on preschool teachers and ECEC leaders.

This dissertation seeks to address this gap, as such research is crucial given the extraordinary nature of the COVID-19 pandemic's impact on the ECEC sector. Specifically, the dissertation explores the unique challenges faced by preschool teachers and ECEC leaders during the crisis, contributing to both theoretical discussions and practical recommendations for enhancing support structures and resources for ECEC professionals in future crises. In addition, the dissertation proposes novel methodological approaches for capturing the complexities of such situations in future research.

To contextualize these contributions, results are discussed below and the conclusions of the three manuscripts are presented. This section aims to advance ECEC research and better reflect the lived experiences of preschool teachers and ECEC leaders. Both repeated online assessments and qualitative semi-structured interviews were used to test all hypotheses empirically. The findings of the manuscripts are summarized in relation to the hypotheses and discussed within the theoretical framework. Comparisons with other studies highlight similarities and differences concerning the hypotheses (5.1). In addition, the limitations of this work, including methodological, conceptual, and practical constraints, are discussed, and research gaps are identified (5.2). Finally, theoretical, methodological and practical implications are presented, including contributions to a multilevel framework, and suggestions for future research directions (5.3).

## 5.1. Summary and Discussion of Main Results

This dissertation investigates how the COVID-19 pandemic shaped perceived loads, load reactions, and their consequences in the field of ECEC. The following chapters provide a summary of the main findings aligned with the hypotheses and a detailed discussion of the three empirical studies.

### *5.1.1. ECEC professionals perceived loads and load reactions (Hypothesis 1)*

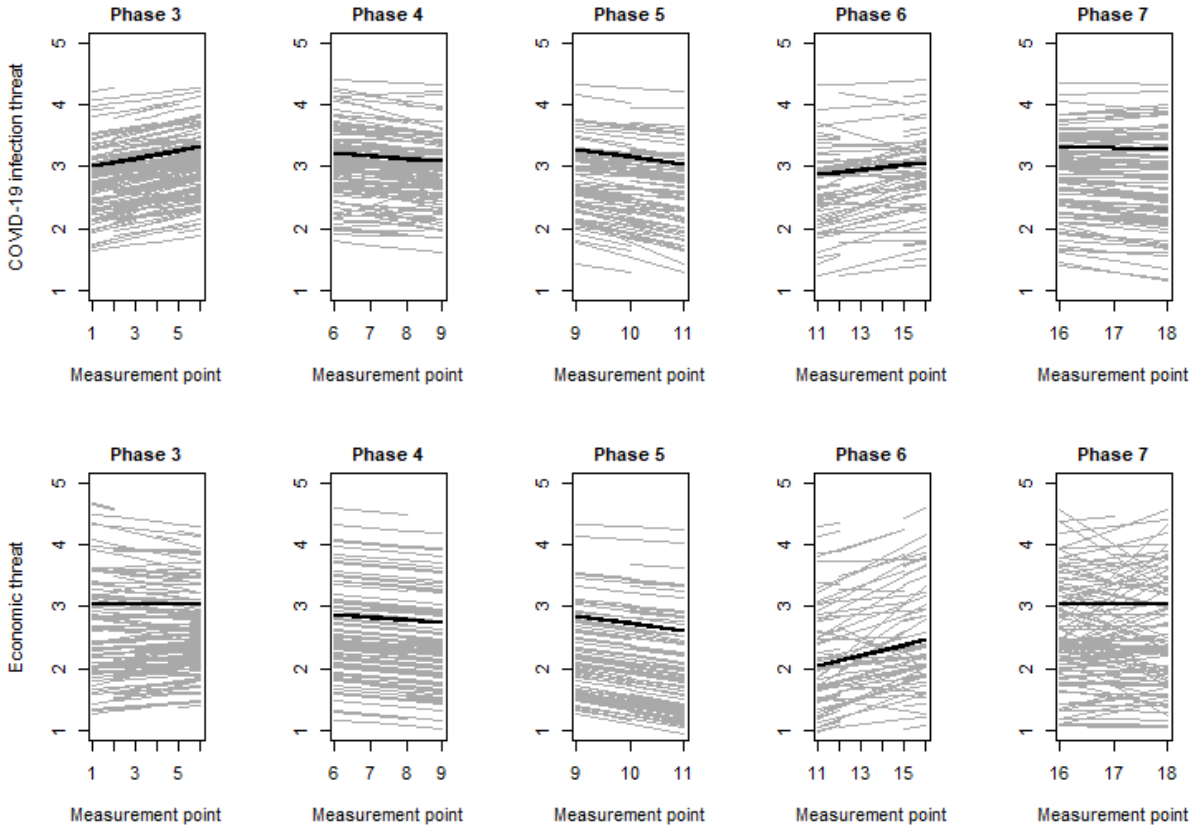
To examine patterns of stability and change in COVID-19-related loads and load reactions, I analyzed data from Manuscripts 1 and 2 using the retrospective phase classification proposed by Tolksdorf et al. (2022). Mixed linear models were estimated separately for each perceived load (COVID-19 infection threat, economic threat) and each load reaction (stress experience, positive affect, negative affect, COVID-19-related mental strain), covering pandemic Phases 3 to 7. At Level 1 (within-person), intraindividual changes over time were assessed, while Level 2 (between-person) accounted for interindividual differences in change rates.

As described in section 2.1, Phases 3, 4, 6, and 7 were marked by high infection rates, renewed restrictions, and ongoing challenges, whereas Phase 5 represented a period of relative relief, characterized by lower infection rates and the lifting of restrictions. Therefore, *Hypothesis 1a* posited that participants' perceptions vary across pandemic phases, reflecting phase-specific conditions and societal measures. *Hypothesis 1b* assumed that, despite these contextual changes, individual response patterns would remain relatively stable across participants, indicating homogeneous intraindividual responses to shifting pandemic conditions across ECEC professionals. To complement the quantitative analyses, *Hypothesis 1c* explored qualitative interview data from ECEC leaders. The aim was to identify specific loads and examine whether these differed from the perceptions of preschool teachers.

In the following sections, I first present the results for Hypotheses 1a and 1b, structured by type of load and load reaction, and followed by exploratory findings addressing Hypothesis 1c. A summary of all findings related to Hypothesis 1 concludes this section.

**Figure 3**

*Spaghetti Plots of average (black lines) and subject-specific (grey lines) Regression Lines for phase-specific Changes in Loads*




To investigate changes in COVID-19 pandemic related loads (*H1a*) among preschool teachers, Study 2 assessed monthly reports on infection threat and economic threat over an 18-month period (September 2020 to February 2022). As shown in Figure 3, the change rates of both constructs fluctuated across the pandemic phases, revealing periods of consistent change (black lines) as well as phases marked by notable variability in changes rates between individuals (grey lines).

The results largely support *Hypothesis 1a* regarding *infection threat*: Preschool teachers' perceptions generally mirrored changes in incidence rates. Two notable exceptions emerged, however: In Phase 4, perceived infection threat declined despite persistently high infection rates and in Phase 7, infection threat stagnated even though incidence rates remained elevated. These discrepancies may reflect adaptive processes. As teachers adjusted to the prolonged crisis and engaged more actively in protective behaviors, their sense of control likely increased – diminishing

the perceived severity of the threat. This is consistent with the concept of risk adaptation, as outlined by Martin-Lapoirie et al. (2024), who found that heightened engagement in protective behaviors was associated with reduced risk perception in high-incidence contexts. Beyond adaptation, the data may also indicate habituation effects. Over time, prolonged exposure to high COVID-19 activity – particularly in Phases 4 and 7 – appears to have led to a gradual decline in perceived infection threat. This aligns with research on risk habituation, a psychological mechanism whereby repeated exposure to threat reduces cognitive, emotional, and behavioral responses (Thompson, 2009). While empirical studies on in the domain of risk perception remain scarce (Lima, 2004), the findings suggest that habituation may have attenuated teachers' threat appraisals. This interpretation is further supported by evidence of declining COVID-related anxiety over time (Costa et al., 2022), highlighting the dynamic and context-sensitive nature of risk perception during the pandemic.

A comparable pattern is observable regarding *economic threat* across Phases 4 to 7, with one key distinction: No significant change was detected in Phase 3, suggesting that the financial consequences of the COVID-19 pandemic may not yet have fully materialized during its early stages. By Phase 6, however, economic threat perceptions increased substantially. This increase may reflect the growing dissatisfaction among preschool teachers, whose workload intensified under pandemic conditions without corresponding financial recognition. This finding resonates with the effort–reward imbalance model (Siegrist, 1996) which suggests that stress reactions are amplified when individuals feel their efforts are not adequately compensated.

Taken together, these findings provide nuanced support for *Hypothesis 1a*. Perceptions of infection and economic threat showed systematic variation across pandemic phases. While these changes might partly mirror objective pandemic developments, such as fluctuating incidence rates, they may also be shaped by adaptive responses, contextual influences, and subjective interpretations.

Regarding individual change rates (*H1b*), the findings suggest rather consistent patterns in preschool teachers' perceptions of COVID-19 infection threat (Phases 4 and 5) and economic threat (Phases 3, 4, and 5) among preschool teachers. Within these phases, perceived loads followed similar trajectories across participants, providing phase-specific support for *Hypothesis 1b.* However, increased variability emerged in Phase 6 for both types of loads and in Phase 7

specifically for economic threat. These interindividual differences in change rates remain speculative and are addressed in the subsequent section.

Variations in perceived *infection threat* during Phases 3, 6, and 7 may be attributable to both institutional and individual factors. These include the extent of implemented health protection measures, staff members' personal risk status, age, and health conditions. Additionally, structural features of childcare centers – such as group size, staffing levels, and working conditions – have been shown to shape pandemic-related experiences (Kuger et al., 2022). Psychological factors also play a key role in shaping risk perception. For instance, higher prosocial tendencies, trust in science and medical professionals, and personal efficacy are linked to heightened risk awareness. In contrast, more individualistic worldviews, stronger trust in government, and collective efficacy are associated with lower perceived risk (Dryhurst et al., 2020; Schneider et al., 2021).

A comparable pattern is evident for *economic threat*, which likely varies with employment status, income level, and overall financial security (King et al., 2016; Selenko & Batinic, 2011). According to the BRB model, load perception is influenced not only by external conditions but also by relatively stable intrapersonal characteristics and resources. During the early pandemic phases (Phases 3–5), individual dispositions – as resilience and coping capacity – may have remained relatively stable, thereby shaping how economic threats were interpreted. Consequently, variability in these internal resources may help explain heterogeneous trajectories of perceived economic threat.

In summary, the findings for *Hypothesis 1b* suggest that perceived pandemic-related loads were relatively stable across the sample during earlier phases, while interindividual variance increased in later phases. This growing divergence may reflect interactions between personal resources and institutional conditions. Future research should further investigate the individual and contextual factors underlying this variability. Longitudinal studies could explore the dynamic interplay between internal resources (e.g., coping or adapting strategies) and contextual elements (e.g., leadership communication, team support). Qualitative research may also yield valuable insights into individual adaptation processes. Furthermore, social and institutional dynamics – such as team climate, peer exchange, and collective coping – remain underexplored but may substantially shape how loads are experienced in ECEC contexts. Despite these open questions, the present results provide robust support for Hypothesis 1b.

To comprehensively address *Hypothesis 1*, I will now address the stability and change in *preschool teachers' load reactions*. The results are based on findings from Manuscripts 1 and 2, which offer detailed insights into how these reactions evolved across different pandemic phases.

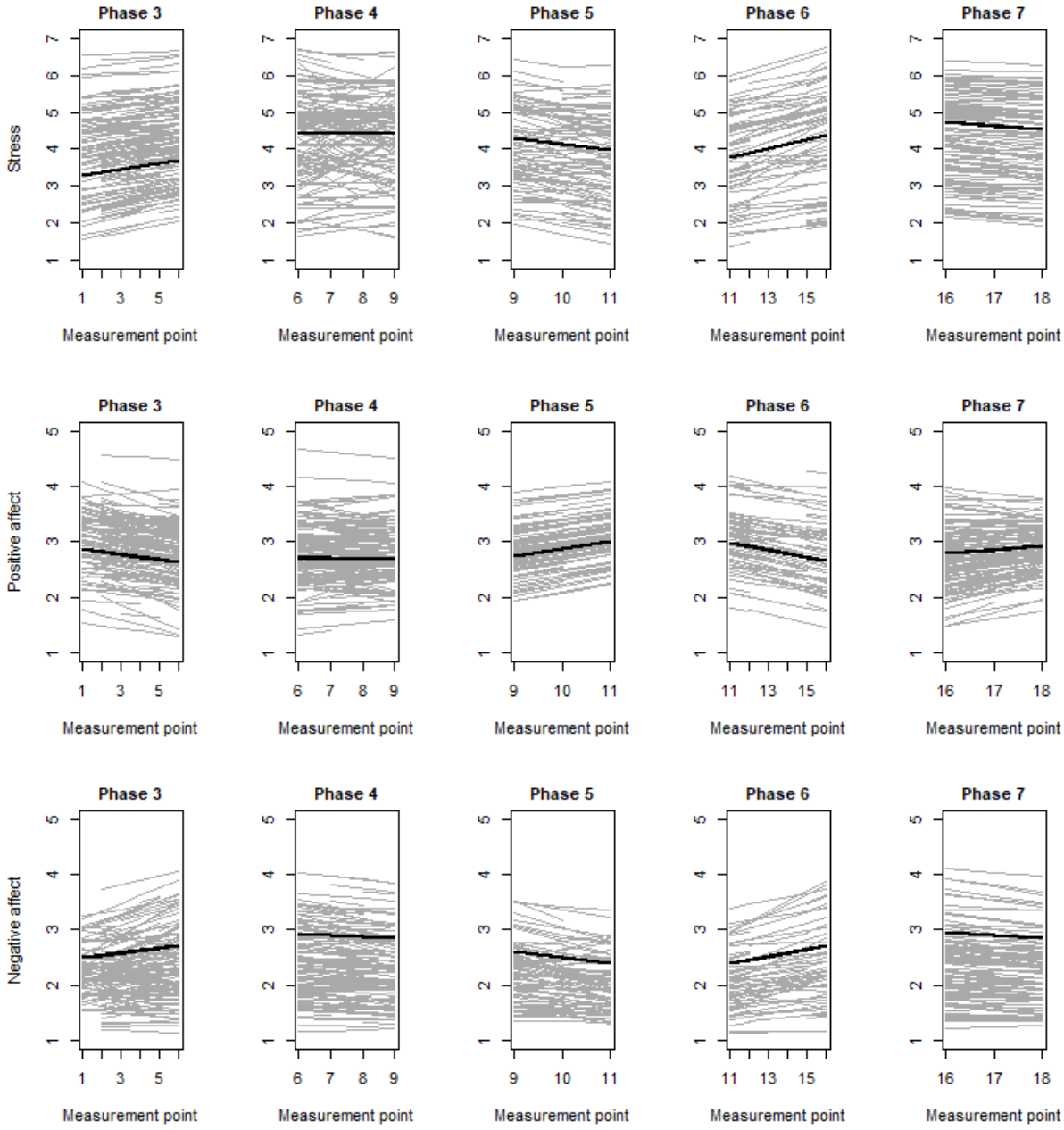
In line with theoretical expectations about phase-related changes (*H1a*), stress experiences, negative affect, and COVID-19-related mental strain were expected to increase during phases of high COVID-19 activity (Phases 3, 4, 6, and 7), accompanied by a decrease in positive affect. Conversely, during phases of lower infection activity (Phase 5), a reversal of this pattern was anticipated. These assumptions align with the BRB model (Rudow & Fischer, 2023), which posits that external loads directly influence load reactions, while periods of relief foster recovery and stabilization. Thus, preschool teachers' well-being appears closely tied to the dynamic interplay between pandemic-related loads and the broader ECEC context.

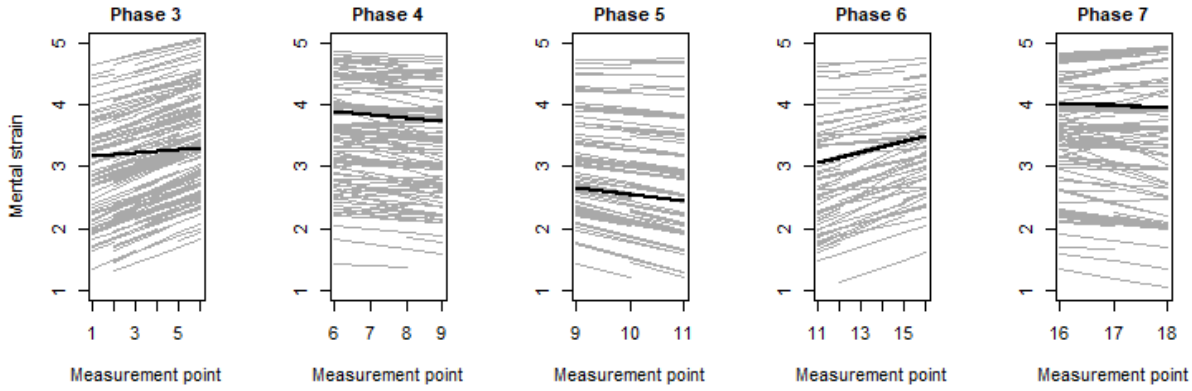
Figure 4 illustrates the development of load reactions across pandemic phases, highlighting both temporal patterns and interindividual variability. Negative load reactions (stress experience, negative affect, mental strain) and positive affect largely followed the expected trajectories. Notably, when high-intensity phases (e.g., Phases 3 and 6) were followed by another phase with sustained high incidences (Phases 4 and 7), negative reactions remained elevated rather than increasing further. This plateau effect may reflect habituation or adaptation processes, as described in stress and coping theories (Lazarus & Folkman, 1984; Thompson, 2009), where chronic exposure leads to stabilization rather than escalation of strain.

However, two deviations emerged. First, stress experience did not decline in Phase 5 as hypothesized, but stagnated and increased again in Phase 6. One possible explanation lies in the persistent uncertainty between Phases 3 and 5, marked by frequent revisions of lockdown measures. This unpredictability – including unclear timelines for reopening preschools – limited preschool teachers' ability to adequately plan for emergency care and the resumption of regular operations on short notice (Autorengruppe Corona-KiTa-Studie, 2021). Second, positive affect unexpectedly increased in Phase 7, contrary to expectations of prolonged exposure to high loads results in cumulative strain and diminished emotional resources. This could be attributed to the development of effective coping mechanisms or external factors such as vaccine rollout or the gradual easing of restrictions, which may have fostered renewed optimism.

**Figure 4**

*Spaghetti plots of average (black lines) and subject-specific (grey lines) Regression Lines for phase-specific Changes in Load Reactions and Consequences*






***Note.*** To strengthen the coherence of the results presented, the results for subjective stress experience were calculated for the period of 18 measurement points, as the results of Manuscript 1 only covered the period of 12 months. The complete results can be found in Appendix A.

Regarding individual *change rates in load reactions* (*H1b*), a noteworthy contrast emerges compared to change rates in perceived loads. While the perception of pandemic-related loads became more variable over time – particularly in later phases – load reactions were more heterogeneous at the beginning and converged as the pandemic progressed, especially in Phases 4 and 6. This pattern suggests that early responses were shaped by diverse individual and contextual conditions, while later responses reflected a more uniform collective experience. One plausible explanation is the initial fragmentation of regional measures in early pandemic stages, which likely led to diverse stress responses. In contrast, the increasing standardization of regulations in later phases may have contributed to more aligned experiences across settings (Kuger et al., 2022). This convergence underscores the shared nature of the burden and indicates a broad-based impact on ECEC professionals. These findings emphasize that the pandemic posed not only individual but also systemic challenges. The emerging uniformity in later phases signals a collective vulnerability, reinforcing the need for sustained institutional support. Ensuring equitable resource allocation and improving working conditions are crucial steps in mitigating the impact of prolonged crises in the ECEC sector.

Taken together, the results largely confirm *Hypothesis 1a*, reflecting dynamic adjustment to the evolving pandemic. *Hypothesis 1b* is partially supported, indicating consistent patterns in certain phases but also highlighting the need to further explore interindividual differences. The assumptions of the BRB model are substantiated, yet integrating adaptation processes such as habituation and coping more explicitly would enhance its explanatory power. Future research

should investigate the long-term trajectories of load reactions and examine how structural conditions and institutional support mechanisms influence emotional resilience among ECEC professionals.

The following section addresses *Hypothesis 1c* by presenting findings from Manuscript 3, contextualized through comparisons with Manuscripts 1 and 2. Drawing on interview data collected between December 2020 and June 2021 (covering Phase 3 partially and Phase 4), the qualitative results illustrate how the COVID-19 pandemic affected ECEC leaders across four distinct levels, as identified through open and axial coding.

*At the institutional level*, ECEC leaders were required to implement rapidly evolving and often impractical regulations while managing hygiene protocols and infection control measures. Group separation measures were frequently introduced to minimize contact and reduce infection risks. Nearly half of the participants reported persistent uncertainty in responding to frequently changing policies, lacking the planning security necessary for both operational and pedagogical continuity. These findings mirror prior research emphasizing the overwhelming complexity caused by excessive and inconsistent information (Kuger et al., 2022). Additionally, about 30% reported that general leadership tasks and routine pedagogical work were significantly disrupted. Furthermore, at the *interactional level*, leaders faced difficulties in maintaining relationships with parents and teams while ensuring effective communication and mutual support.

*At the leadership level*, nearly 90% reported a sharp increase in bureaucratic and organizational demands. These findings are consistent with Oeltjendiers et al. (2021), where 92% of respondents indicated heightened administrative workload. Furthermore, 17% described a dissolution of conventional working hours, often working weekends and remaining permanently available. Approximately 40–50% reported experiencing considerable psychological strain, including heightened fears, worries, and an increased sense of responsibility.

Some ECEC leaders also identified *positive experiences*, such as more family time and an acceleration of digitalization. These developments echo earlier findings on the creative strategies institutions used to maintain contact with children and parents (Anders, 2021; Kuger et al., 2022). While the pandemic has pushed digital progress in many ECEC institutions, there remains an urgent need for improved equipment, knowledge, and tools to fully capitalize on these developments.

While methodological differences exist across the three manuscripts presented in this dissertation, notable parallels emerge regarding the pandemic's impact. Both ECEC leaders and preschool teachers faced shifting working conditions and regulations. However, their load reactions diverged. Preschool teachers reported immediate emotional and cognitive strain in response to daily disruptions. In contrast, leaders primarily described ongoing uncertainty and the administrative burden of policy implementation. Rather than viewing themselves as directly affected by threat-related stressors, leaders framed their experience in terms of safeguarding institutional continuity and organizational stability. This interpretation expands previous findings (Strehmel, 2023; Strehmel et al., 2023), which underscore the distinct responsibilities of ECEC leaders in managing staff well-being, maintaining operations, and absorbing systemic instability. It illustrates that institutional loads are not only externally driven but also shaped by professional role and leadership function.

Thus, the qualitative findings of Manuscript 3 complement the quantitative results of Manuscripts 1 and 2. While preschool teachers' perceived loads fluctuated with the intensity of pandemic phases, leaders faced ongoing demands for flexibility and crisis adaptation This persistent need strained leadership capacity, reduced pedagogical engagement, and heightened institutional pressure. Both groups reported considerable mental strain, although in different forms: Preschool teachers showed immediate load reactions, whereas leaders carried the dual burden of administrative coordination and team leadership. Notably, leaders did not report personal fears related to infection or economic insecurity but acknowledged such concerns among their teams and implemented protective measures. In contrast, preschool teachers expressed these threats more directly. This difference suggests that while leaders managed health and financial or organizational challenges (e.g., staff shortages due to quarantine or unclear funding for COVID-19 related measures), they framed their role as stabilizers rather than as personally burdened individuals. Their focus remained on buffering the institutional impact rather than emphasizing their own vulnerability. In sum, these findings support and extend Hypothesis 1 by showing that perceived loads and responses differed by pandemic phase and professional role. They underscore the importance of role-specific responsibilities and institutional context in shaping COVID-19-related experiences and resilience, thereby refining the BRB Model's application to ECEC settings.

### *5.1.2. Association of Perceived Loads and Load Reactions (Hypothesis 2)*

To test *Hypothesis 2*, I examined the associations between COVID-19-related loads and corresponding reactions among preschool teachers, as outlined in Manuscript 2. Drawing on monthly data from Study 2, collected over an 18-month period (September 2020 to February 2022), separate mixed linear models were estimated for each type of load (infection threat, economic threat) and each load reaction (negative affect, positive affect, COVID-19-related mental strain). Rather than distinguishing between specific pandemic phases, the entire study period (Phase 2 to Phase 7) was analyzed to identify overarching patterns and dynamic associations. This design allows for a nuanced understanding of how pandemic-related loads were reflected in preschool teachers' affective well-being and mental strain over time. At Level 1, within-person variations in both loads were analyzed in relation to fluctuations in affective well-being and mental strain. At Level 2, between-person differences in these associations were examined.

*Hypothesis 2* posited that higher perceived loads would be associated with increased negative affect, decreased positive affect, and elevated mental strain. The results confirmed these assumptions: both infection and economic threats were significantly linked to impaired affective well-being and heightened mental strain at both the intra- and interindividual level.

At Level 1, increases in perceived infection or economic threat were associated with increased negative affect and mental strain, highlighting the immediate impact of perceived loads on affective well-being and mental strain. At Level 2, individuals who perceived higher levels of infection and economic threat reported greater impairment in their affective well-being and elevated mental strain throughout the study period. Conversely, those with lower perceived loads maintained more stable affective well-being and experienced less strain. These findings align with previous research (Han et al., 2021), which showed that participants reporting higher average threat levels experienced fewer positive and more negative emotions, such as anxiety, depression, and exhaustion.

One of the most relevant findings is the stronger impact of infection threat compared to economic threat. While previous studies (Kira et al., 2021; Timming et al., 2021) found similar effects of both types of threat on depression, anxiety, and psychological distress, the present results suggest that health-related stressors affect affective well-being and mental strain more immediately and intensely. In contrast, economic threats may have been perceived as more gradual and indirect in their impact. This assumption is supported by findings from Hypothesis 1, which showed that

economic consequences were less pronounced in earlier phases (e.g., Phase 3) but became more salient as the pandemic persisted (e.g., Phase 6) and its impact on working conditions intensified.

Specific characteristics of the sample may also explain the observed differences in the intensity of both loads. Cerda and García (2022) identified key predictors of infection-related fear, such as chronic illness, family infectivity, and perceived risk to loved ones. For instance, preschool teachers – many of whom are women and mothers – may have perceived greater risk due to close contact with potentially asymptomatic children and concerns about vulnerable family members. Moreover, as greater knowledge about COVID-19 has been linked to lower fear levels, transparent, factual, and reassuring communication could help mitigate excessive fear while maintaining awareness of real risks (Cerda & García, 2022). Targeted health literacy interventions may help reduce infection-related anxiety, thereby improving affective well-being and mental strain. Structural protection and transparent crisis communication are essential to mitigate infection-related reactions in this occupational group.

Another striking result is the strong association between both infection and economic threat and negative affect and mental strain at the between-person level (Level 2). Notably, infection and economic threat appear to have a much stronger impact on the intensification of negative affect and mental strain than on the reduction of positive affect, suggesting that negative affect and mental strain are particularly sensitive indicators of prolonged exposure to perceived loads. The weaker associations with positive affect highlight that, while negative outcomes are strongly influenced by pandemic-related loads, positive affect remains relatively less affected.

Taken together, these results support *Hypothesis 2* by demonstrating that both short-term fluctuations and long-term load perceptions significantly affect affective well-being and mental strain. While momentary increases in loads can influence immediate load reactions, it is the persistent perception of threat – especially at the between-person level – that has the greatest impact on psychological outcomes. From the perspective of the BRB model, the findings confirm that perceived pandemic-related loads function as psychologically relevant stressors. Especially at the between-person level, persistent threat perceptions are linked to sustained impairments in well-being and mental strain, aligning with the model's emphasis on stable load perceptions as critical determinants of well-being. In terms of practical implications, preventive measures should address both external stressors and individual appraisal processes. Interventions such as cognitive restructuring or mindfulness-based approaches (Roeser et al., 2013), could be effective in helping

individuals develop more adaptive threat assessments and manage load reactions, ultimately mitigating mental health impairment. Strengthening these coping strategies is crucial, particularly for ECEC professionals with consistently high loads. The role of coping resources in this context is discussed in greater detail in the following section.

### *5.1.3. The Role of Resources in Preschool Teachers' Load Reactions (Hypothesis 3)*

*Hypothesis 3* examined the role of personal resources in shaping preschool teachers' reactions to perceived loads. Mixed linear models were applied in Manuscripts 1 and 2 over a 12-month (Study 1) and 18-month (Study 2) period to test the impact of self-efficacy and the moderating role of emotion regulation strategies, both at the within-person (Level 1) and between-person (Level 2) level. Results for Hypothesis 3a (self-efficacy) and Hypothesis 3b (emotion regulation) are presented below, followed by an integrative summary.

Based on prior research (Bandura, 1986; Schwarzer & Hallum, 2008), *Hypothesis 3a* posited that lower self-efficacy would be associated with increased stress experience at both analytical levels. This hypothesis was supported: Preschool teachers' stress levels increased at time points when their self-efficacy fell below their personal mean and participants with lower average self-efficacy reported higher stress across the study period. These findings underline the dual nature of self-efficacy as both a stable trait and a situationally responsive resource. The stronger between-person effects support its trait-like nature (Bandura, 1997; Jerusalem, 2016), whereas within-person variability underscores its contextual sensitivity. Previous studies have documented high intraindividual fluctuations in domain-specific self-efficacy among teachers – for instance, in classroom management or student engagement (Zee et al., 2016). This underlines the importance of exploring situational fluctuations in self-efficacy within specific job demands in ECEC contexts.

From a practical perspective, the results suggest that short-term boosts in self-efficacy may not be sufficient to reduce stress sustainably. Instead, interventions should aim to strengthen enduring beliefs. Professional experience (Bullock et al., 2015; Kim & Kim, 2010; Klassen & Chiu, 2010), reflective practices, coaching, and targeted trainings (Labone, 2004; von Suchodoletz et al., 2018) have proven to be effective. In-service trainings that allow sufficient time for teachers to internalize and apply effective teaching strategies (Karim et al., 2021) and feedback mechanisms such as tandem models and supervised practice (Reyhing & Perren, 2021) further promote internalization of self-efficacy beliefs. Health-related trainings that provide achievable success experiences (Boeger & Lüdmann, 2023) may also be transferable to ECEC contexts. These types

of interventions seem particularly promising for improving long-term well-being and stress resilience among preschool teachers, especially in light of the dual trait- and state-like characteristics of this resource (Bakker et al., 2003). Given its dual character, interventions targeting self-efficacy should be implemented early – during pre-service education – and maintained throughout professional development. Less experienced teachers, or those with limited opportunities to build mastery, may particularly benefit from structured and continuous support.

*Hypothesis 3b* focused on the moderating role of emotion regulation strategies – cognitive reappraisal and expressive suppression – on the relationship between COVID-19-related loads (infection and economic threat) and load reactions (affective well-being and mental strain). Drawing on prior findings (Gross & John, 2003; Han et al., 2020; Yin et al., 2016), I hypothesized that reappraisal would buffer, while suppression would amplify the impact of these loads.

The results largely confirmed these assumptions. Cognitive reappraisal demonstrated cross-contextual effectiveness: It moderated the impact of infection threat at the between-person level and buffered economic threat at the within-person level – highlighting its relevance across types of loads and timescales. These findings align with theoretical models and empirical work that identify reappraisal as an adaptive emotion regulation strategy (Gunaydin et al., 2016; Jeon & Ardeleanu, 2020; San Too & Butterworth, 2018), especially when contrasted with more passive or maladaptive strategies such as expressive suppression. Within the framework of the BRB model, reappraisal appears to reduce the subjective intensity of loads and facilitate coping by reshaping the subjective appraisal of loads – thus preserving affective well-being and reducing mental strain over time. Given its efficacy in buffering both chronic and situational loads, cognitive reappraisal may represent a promising target for interventions – especially for professionals operating in constrained environments with limited control over external loads, such as preschool teachers during the COVID-19 pandemic.

In contrast, expressive suppression showed mixed effects that were more context-dependent and, in some cases, contrary to expectations. At the within-person level, higher suppression intensified the association between economic threat and mental strain. At the between-person level, it also amplified the negative link between infection threat and positive affect. These findings align with previous research that links suppression to adverse intrapersonal outcomes, such as increased depressed mood, greater fatigue, and lower life satisfaction on a daily basis, as well as the subsequent development of increased depressive symptoms (Cameron & Overall, 2018).

However, one unexpected result was a weaker positive association between economic threat and mental strain among individuals with high average suppression. This pattern contradicts the predominantly maladaptive characterization of suppression and points to a more complex relationship. This finding contrasts with prior studies suggesting that suppression serves primarily as a short-term coping mechanism (Catterson et al., 2017). By inhibiting emotional processing of stressors, suppression may contribute to the maintenance and escalation of mental strain over time (Tyra et al., 2021). In the context of the COVID-19 pandemic, suppression may have allowed individuals to avoid expressing their emotional reactions during periods of heightened economic threat. However, by preventing adequate emotional processing, it likely sustained and intensified negative emotional symptoms, ultimately undermining long-term psychological resilience.

Taken together, these findings suggest that the effectiveness of emotion regulation depends on the type of load, the time scale, and the analytical level. Cognitive reappraisal showed consistent benefits, while expressive suppression appeared to exacerbate strain in most contexts. These results are in line with the BRB model, which posits that maladaptive coping strategies such as suppression can increase the subjective intensity of loads and undermine resilience over time.

In sum, the findings for Hypothesis 3 confirm the central role of personal resources in shaping load reactions. Self-efficacy and cognitive reappraisal emerged as robust protective factors, while expressive suppression tended to intensify mental strain. Especially under prolonged and uncontrollable demands – as during the COVID-19 pandemic – fostering adaptive personal resources may be essential to support psychological resilience in ECEC professionals. Building these resources through targeted interventions may not only reduce stress but also enhance professional functioning. Prior research links higher self-efficacy with improved teaching quality and child outcomes (Caprara et al., 2006; Klassen & Tze, 2014; Schiefele & Schaffner, 2015), emphasizing the potential of integrated approaches that promote both psychosocial and professional strengths. In the following section, I will discuss the general limitations of this dissertation in greater detail and propose directions for future research to further investigate the complex interplay of loads, load reactions, and resources in ECEC settings.

## 5.2. General Limitations and Future Directions

Overall, the present dissertation provides a comprehensive assessment of perceived loads and load reactions among ECEC professionals during the COVID-19 pandemic. To date, no comparable longitudinal study in this field has been reported. While the findings provide valuable insights into ECEC professionals' experiences across time, several limitations should be considered when interpreting the results.

First, several limitations must be considered with regard to the study designs and sample characteristics of the discussed manuscripts. The longitudinal design with monthly data collection over 12–18 months (Studies 1 and 2) enabled the observation of dynamic developments. However, comparisons with pre-pandemic baseline data were not possible due to the unexpected onset of the crisis. Furthermore, Study 3 employed qualitative methods but lacked a longitudinal design, which limited its capacity to detect temporal developments and weakened the robustness of its conclusions. In addition, the generalizability of the findings is constrained by the national scope of the sample (Germany), making cross-cultural or cross-sector comparisons (e.g., with primary education settings) difficult. Despite recruitment efforts across federal states, the regional distribution of participants was uneven, and certain areas were underrepresented. Moreover, high dropout rates and missing data at both early and later stages reduced statistical power and complicated the interpretation of results. However, 31.6% of participants declined financial compensation, suggesting that intrinsic motivation (e.g., sharing their experiences) may have outweighed financial incentives. Meanwhile, the voluntary nature of participation may have resulted in a self-selected sample that was more resilient to COVID-19-related loads, thereby limiting the generalizability of the findings. Consequently, to ensure continuous monitoring of the effects of external loads, future research should establish regular, semi-annual longitudinal assessments at the national level. This would allow for the creation of robust, continuously updated datasets that serve as reliable baselines, even during crises. Systematic data collection over time would facilitate the monitoring of both typical fluctuations and crisis-related shifts in stress exposure, reactions, and resource availability among ECEC professionals.

Second, the methodical approaches chosen in the prosed manuscripts limit the validity of the findings to some degree. For example, data were collected via online self-report, introducing potential biases such as social desirability, subjective interpretation, and common method variance. Also, while the applied stress measure (Elo et al., 2003) is validated for occupational health

monitoring, it consists of a single item, offering limited precision and restricts the depth of understanding concerning the nature of stress among preschool teachers. Similarly, self-efficacy was assessed using a short scale (Beierlein et al., 2013), which may not capture domain-specific aspects of ECEC work (e.g., parent collaboration), despite evidence that such differentiation matters (Zee et al., 2016). Furthermore, several instruments used in this study were not specifically validated for longitudinal research, potentially limiting the reliability of inferences about changes over time. Although the extended data collection period provided valuable insights, the reliance on non-standardized measures may have compromised data quality and the depth of interpretation. In line with efforts to reduce survey burden (Drolet & Morrison, 2001), this pragmatic approach may have come at the cost of a more comprehensive understanding of preschool teachers' evolving experiences. To address these limitations, future research should prioritize the development of comprehensive, domain-specific instruments that reflect the unique challenges of the ECEC profession. Tailored, multi-dimensional scales would enhance both the validity and contextual relevance of findings. Moreover, integrating objective physiological indicators, such as heart rate variability (HRV) or cortisol levels (Bellingrath et al., 2008; de Schipper et al., 2009; Lam et al., 2009; Moustaka et al., 2015), could complement self-reported data. These physiological measures would allow for a more accurate and holistic assessment of stress responses, contributing to a deeper understanding of the physiological impact of work-related stressors. Combining subjective and objective data could thus yield more nuanced insights into stress dynamics and support the early identification of risk markers – facilitating targeted interventions to prevent burnout and foster professional well-being.

Third, while the present studies offer valuable insights into preschool teachers' experiences of load and load reactions during the COVID-19 pandemic, several potentially relevant explanatory factors remain unexamined. This limits a more nuanced understanding of why some individuals proved more resilient than others under comparable conditions. A key set of unexplored influences concerns the institutional and regional context. Although the longitudinal data revealed overarching patterns in perceived loads and reactions, institutional-level variables (e.g., resource availability, leadership quality, team climate, and the clarity of internal communication) that may have shaped individual trajectories were not systematically assessed. Additionally, differences in federal policy – such as hygiene regulations, group size limits, or emergency care provisions – may have contributed to variation across sites. Likewise, at the individual level, personality traits, professional experience, and workplace conditions are likely determinants of adaptive coping

processes. Although neuroticism was statistically controlled as a covariate, its explanatory relevance was not a focus of the analyses. Yet personality traits are robust predictors of stress and burnout (Cano-García et al., 2005; Kokkinos & Davazoglou, 2005), with high neuroticism and introversion being linked to increased vulnerability. Professional experience may have served as a protective factor, as experienced staff often draw on established coping routines and benefit from stronger professional networks. Similarly, contextual workplace factors – such as team stability or staff shortages – likely influenced how preschool teachers managed the evolving demands of the pandemic (Cumming, 2017; Kusma et al., 2012; Whitebook & Sakai, 2003). To minimize participant burden, the survey included only a limited set of covariates. While this pragmatic choice is defensible (Drolet & Morrison, 2001), it resulted in the omission of crucial contextual and individual variables. Their absence reduces the ecological validity of the findings and constrains the potential for deriving targeted policy or institutional recommendations. Future research should therefore adopt more comprehensive, multilevel approaches that integrate individual traits and contextual variables, incorporating higher-resolution temporal assessments. A promising strategy would be to recruit participants via ECEC leaders and offer regular feedback reports as an incentive. Endorsement by center leadership – or even institutional expectations of participation – may increase compliance and enhance data quality. This approach would also facilitate the systematic inclusion of center-level characteristics, such as leadership style, team cohesion, and facility size, enabling more granular analyses of multilevel dynamics (Kwon et al., 2022). A more nuanced understanding of how personal dispositions and environmental structures interact in shaping professional well-being may inform the development of targeted interventions – both in crisis contexts and in everyday ECEC practice. Considering the outlined design-, sample-, and measurement-related limitations, as well as unexplored explanatory mechanisms, the following section discusses broader implications for research, practice, and policy in early childhood education and care.

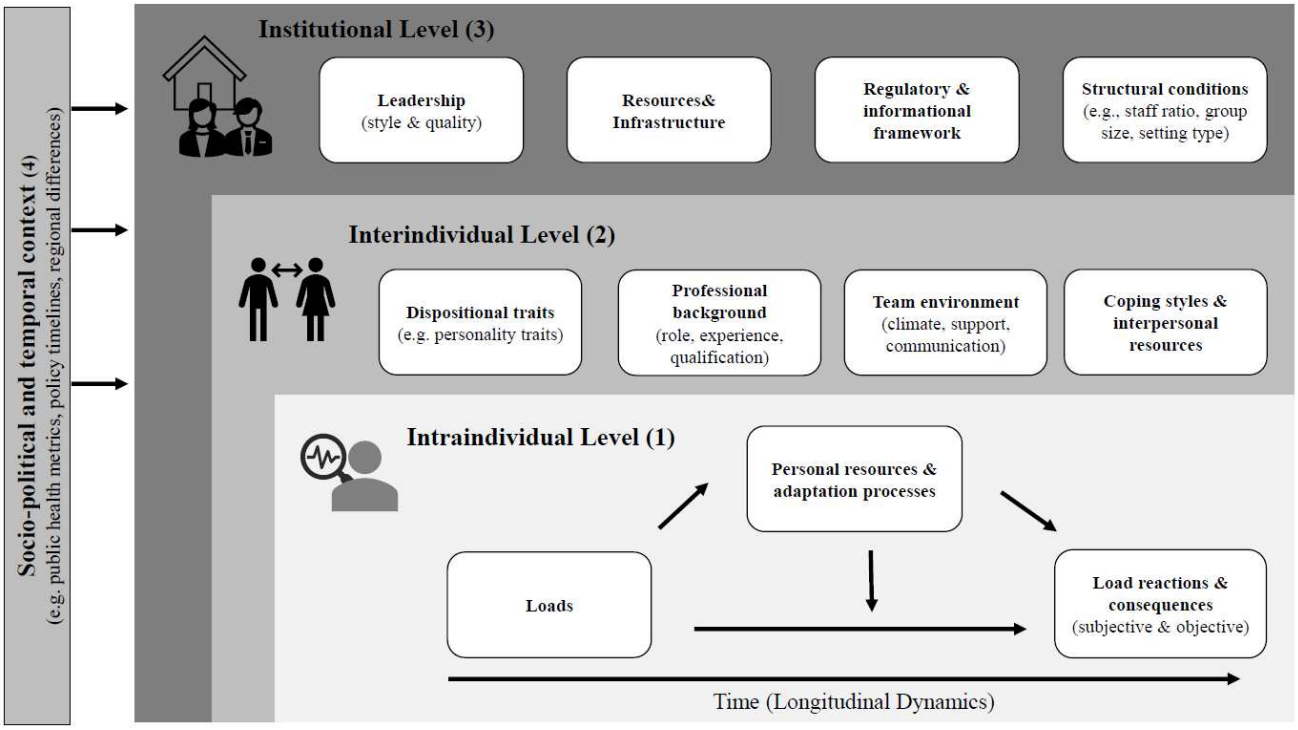
## 5.3. Implications for Theory, Future Research, and Practice

This dissertation yields important implications for future research, practice, and policy in the field of ECEC. Drawing on the empirical findings and existing literature, I outline theoretical and methodological contributions, followed by practice-oriented recommendations.

A central theoretical contribution lies in the further development of the BRB model (Rudow & Fischer, 2023) into a multilevel framework that better reflects the complexity of professional strain in ECEC, especially during prolonged societal crises such as the COVID-19 pandemic. Based on empirical patterns and converging evidence from related studies, I propose an extended model that incorporates intraindividual, interindividual, and institutional levels, as well as temporal dynamics of external factors (see Figure 5). This reconceptualization promotes an multilevel perspective that situates individual experiences within interpersonal, systemic and dynamic, time-sensitive processes.

**Figure 5**

*Further Conceptual Development of the BRB Model into a Multilevel Framework to Assess and Contextualize the Complexity of Professional Loads in ECEC Settings*



At the *intraindividual level (1)*, the findings underscore that perceived loads and personal resources (e.g., self-efficacy, emotion regulation strategies) fluctuate over time and co-determine ECEC professionals' load reactions and several other outcomes. These dynamics reflect evolving psychological processes under crisis conditions. Accordingly, theoretical models should move beyond static, trait-based frameworks and integrate phases of adaptation, stagnation, and recovery, including mechanisms such as habituation and risk normalization – which may explain decreasing perceived strain despite persistent stressors. Methodologically, this calls for high-frequency longitudinal or diary-based designs and objective physiological assessments (e.g., heart rate variability, cortisol levels) to capture intraindividual variability, non-linear trajectories, and time-contingent effects which are otherwise missed in cross-sectional studies.

At the *interindividual level (2)*, stable characteristics such as personality traits, professional roles (e.g., teacher vs. leader), and years of experience shape how professionals perceive and respond to loads (Andersson Søe et al., 2023; Klassen & Chiu, 2010). The findings of this dissertation point to the need for research approaches and tailored interventions, as well as theoretical refinements that incorporate such moderators. Moreover, structural inequalities – including low pay, lack of benefits, and financial insecurity – heighten perceived economic threat and should be systematically integrated into models of occupational well-being (Hall-Kenyon et al., 2014; King et al., 2016; Vesely et al., 2022).

Both the qualitative findings of this dissertation and existing research underscore that collegial support, a positive team climate, and processes of shared meaning-making are essential for buffering perceived load and fostering resilience. High-quality work environments, opportunities for collaboration, and professional autonomy are well-established protective factors for professional and occupational well-being (Cumming, 2017; Løvgren, 2016; Schreyer & Krause, 2016). I propose that these social and interpersonal resources must be more explicitly incorporated into the updated BRB model. Additionally, institutional hierarchy and professional status (e.g., leadership roles) influence access to core resilience resources such as autonomy and control (Totenhagen et al., 2016), underscoring the need to integrate professional status and role as key regulatory factors in multilevel models of occupational load.

At the *institutional level (3)*, the proposed model extension emphasizes the significance of organizational structures and leadership practices as contextual determinants of occupational wellbeing. The empirical data, supported by prior research, indicates that local crisis responses

(e.g., hygiene protocols, communication styles, staffing decisions) significantly shaped professionals' experiences (see Table 1) during the COVID-19 pandemic. Institutional characteristics, such as participation opportunities, leadership styles, and the implementation of COVID-19-related policies either mitigated or intensified individual strain (Flöter et al., 2023). These differences help explain why some settings fostered resilience while others exacerbated cumulative strain. These findings align with research emphasizing the importance of institutional culture – the shared norms, assumptions, and practices – in shaping staff well-being and turnover (Stearns et al., 2014). Consequently, I argue for a more explicit integration of institutional determinants into the BRB model. Leadership plays a central role in this context. As shown in the qualitative findings, ECEC leaders must navigate pedagogical, administrative, and advocacy demands – often under pressure and without adequate support (Fonsén et al., 2023). The critical role of leadership in promoting staff wellbeing and organizational resilience was well documented even before the pandemic, but the crisis has further magnified its significance and made underlying vulnerabilities more visible (Kivunja, 2015). Resilience, under these conditions, emerges not only as an individual capacity but as a systemic feature shaped by institutional preparedness and leadership quality (Fonsén et al., 2023; Parrila & Mäntyjärvi, 2023; Teo et al., 2017). Particularly during prolonged crises, resilience cannot be taken for granted – it must be actively maintained to prevent system-wide exhaustion (Smith, 2017).

Finally, these dynamics must be situated within the broader *socio-political and temporal context (4).* For example, in the context of the COVID-19 pandemic, external factors such as infection waves, lockdown measures, political decisions, and vaccination campaigns substantially shaped ECEC professionals' experiences of threat and recovery. Future research should integrate macro-level data (e.g., public health metrics, policy timelines, regional differences) to enhance ecological validity upcoming studies.

The extended BRB model proposed in this dissertation integrates institutional and contextual dimensions to more accurately reflect the multilevel dynamics of occupational well-being in ECEC. This reconceptualization addresses a central theoretical gap by explicitly linking individual well-being to team processes and structural conditions. Methodologically, it encourages the use of three-level or cross-classified multilevel models and the systematic inclusion of contextual data (e.g., staffing, policies, infection control practices) to capture these interdependencies empirically. Mixed-methods designs that combine longitudinal survey data with

qualitative insights are particularly well-suited to uncover mechanisms of adaptation and resilience. Taken together, the proposed model is not presented as a finalized framework but as a theoretically grounded and empirically informed recommendation for future research and model development – open for testing, refinement, and adaptation across diverse ECEC contexts.

The results of this dissertation further point to several practice-oriented implications for reducing professional load and promoting well-being in ECEC settings. One central claim is the need to strengthen personal resources, particularly self-efficacy and emotional regulation strategies, which buffer stress and support well-being during times of crises, such as the pandemic. Research shows that self-efficacy can be fostered through professional experience (Bullock et al., 2015; Kim & Kim, 2010; Klassen & Chiu, 2010) and targeted in formats such as reflective practices, coaching, and structured training programs (Labone, 2004; von Suchodoletz et al., 2018). In-service trainings that allow time for reflection and transfer have shown particular effectiveness (Karim et al., 2021). Additional benefits stem from tandem teaching and supervised practice, which strengthen self-beliefs through feedback and modeling (Reyhing & Perren, 2021).

Recent intervention studies also demonstrate that brief online programs (Lang et al., 2020) offering modules on stress management and emotion regulation, can increase knowledge and perceived responsiveness. Mindfulness-based programs tailored to daily routines further enhance emotion regulation and self-efficacy (Berlin et al., 2020; Jennings et al., 2020). In line with this, the present data show that adaptive emotion regulation strategies, such as cognitive reappraisal, function as protective resources and may improve the emotional climate in ECEC settings (Roeser et al., 2013). Accordingly, training curricula should systematically integrate these elements, offering reflective spaces and peer support to promote both individual and collective resilience. ECEC professionals with limited experience or part-time roles – who are often more vulnerable to stress – may particularly benefit from such formats. Furthermore, interventions should address both emotion regulation and coping skills as part of regular professional development, as highlighted in previous studies (Roeser et al., 2013). Future interventions should also aim for sustainable, empowering formats, and longitudinal studies are needed to assess long-term effects on ECEC professional well-being. To ensure long-term sustainability, interventions must also tackle the institutional and systemic conditions that undermine ECEC professionals' wellbeing. Systemic loads – such as unclear communication, inadequate resources, and persistent staffing shortages –

play a critical role in undermining well-being and professional functioning, especially during crises like the COVID-19 pandemic (Kuger et al., 2022).

A key issue identified in the qualitative data was the inconsistent and unclear communication of government guidelines – echoing prior findings that ambiguous messaging fosters uncertainty and vulnerability (Klusemann et al., 2020). Public health communication should thus be transparent, timely, and pedagogically tailored. Targeted trainings in crisis communication and infection prevention are essential to enhance ECEC leaders' ability to act confidently and safely in challenging situations.

Staffing shortages, intensified during the pandemic, further compound institutional strain. Beyond impairing the implementation of essential health measures, such shortages heighten emotional load and restrict professionals' ability to focus on pedagogical tasks (Kuger et al., 2022). Despite the long-standing recognition of these systemic issues, including insufficient support and inadequate compensation, addressing them remains challenging due to bureaucratic constraints (Klusemann et al., 2020). One practical recommendation is to relieve pedagogical staff during crises by delegating non-educational tasks to auxiliary personnel, thereby preserving focus on their core responsibilities, reducing their workload, and dedicating more time to creating a positive learning environment for children. Notably, many of these institutional burdens existed well before the COVID-19 pandemic. Poor working conditions, insufficient recovery time, and inadequate pay have long taken a toll on the physical and emotional health of preschool teachers (Kwon et al., 2022). The pandemic has only amplified the urgency to act. Investing in adequate staffing, context-sensitive training, and accessible mental health resources is not merely a reactive response but a preventive strategy for long-term occupational sustainability.

Research confirms that when ECEC professionals are equipped with clear structures and concrete tools for action – such as coherent guidelines and well-resourced settings – they are better able to manage stress and remain attuned to the needs of children, even under pressure (Montgomery & Rupp, 2005). Addressing structural and systemic conditions is therefore essential to strengthen the resilience of ECEC systems in times of crisis and beyond. Therefore, long-term investment in professional wellbeing is indispensable for maintaining both workforce stability and pedagogical quality of ECEC.

# 6. Conclusions

This dissertation investigated the experiences of ECEC professionals and leaders during the COVID-19 pandemic, drawing on the conceptual framework of the BRB model. Across three studies – using longitudinal, multilevel, and qualitative methods – it examined how pandemic-related loads and available resources shaped individual and collective load reactions over time.

The findings show that load reactions emerged from the interplay of cumulative loads and limited resources, embedded within rapidly shifting contextual conditions. Although personal resources such as self-efficacy and emotion regulation offered some protective value, they were insufficient to buffer against the persistent, multilayered demands faced by ECEC professionals and leaders.

Importantly, the studies underscore the need to conceptualize loads and load reactions beyond the individual level. Collective perceptions of threat and responsibility evolved dynamically and were shaped by institutional and social environments. ECEC leaders carried distinct additional loads – institutional, interactional, and individual – while receiving limited systemic support, resulting in complex and often invisible load profiles.

By adopting a multilevel and temporally sensitive approach, this dissertation advances the BRB model conceptually. It emphasizes the relevance of within-person variability, context-dependent dynamics, and the interaction between personal and structural conditions in shaping professional experiences. Practically, the results make clear that fostering well-being in ECEC settings requires more than individual resilience. Sustainable strategies must address structural vulnerabilities by ensuring institutional support, coherent communication structures, and targeted leadership resources. Policymakers are called upon to respond to the systemic fragility of the ECEC sector – both during crises and in routine operations.

In sum, this dissertation offers a differentiated, empirically grounded perspective on professional load reactions in early childhood education in times of crisis. It frames these reactions as dynamic, context-sensitive processes shaped by diverse load constellations and resource conditions. The findings provide a foundation for future research and practical interventions aimed at strengthening resilience, leadership, and structural capacity in ECEC systems.

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# Appendix A: Additional results for subjective stress experience (18-month period)

| | | Phase 3 | | | | Phase 4 | | | | Phase 5 | | | | Phase 6 | | | | Phase 7 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* |
| **Subjective stress experience** | **Fixed Effects** | | | | | | | | | | | | | | | | | | | | |
| | Intercept | 3.30 | <.001 | 0.49 | 2.35 – 4.26 | 4.41 | <.001 | 0.57 | 3.29 – 5.53 | 4.29 | <.001 | 0.61 | 3.09 – 5.49 | 3.77 | <.001 | 0.54 | 2.71 – 4.82 | 4.73 | <.001 | 0.58 | 3.60 – 5.86 |
| | Time | 0.40 | .008 | 0.15 | 0.10 – 0.69 | -0.00 | .992 | 0.16 | -0.32 – 0.31 | -0.31 | .073 | 0.17 | -0.64 – 0.03 | 0.62 | <.001 | 0.168 | 0.29 – 0.95 | -0.18 | 0.271 | 0.17 | -0.51 – 0.14 |
| | **Random effects** | | | | | | | | | | | | | | | | | | | | |
| | *Level 2 (BP)* | | | | | | | | | | | | | | | | | | | | |
| | Intercept | 1.27 | | | | 1.68 | | | | 1.34 | | | | 1.28 | | | | 1.17 | | | |
| | Time[a] | 0.33 | .031 | | | 1.66 | <.001 | | | 0.73 | .161 | | | 0.53 | .369 | | | 0.23 | .919 | | |
| | *Level 1 (WP)* | | | | | | | | | | | | | | | | | | | | |
| | Residual | 1.34 | | | | 0.87 | | | | 0.95 | | | | 0.98 | | | | 1.40 | | | |
| | n/ Observations | 226/715 | | | | 173/501 | | | | 166/337 | | | | 223/ 397 | | | | 157/ 368 | | | |

# Appendix B: Manuscript 1

**Steigleder, J.,** Buhr, L., Ehm, J. H., Gawrilow, C., & von Suchodoletz, A. (2023). Changes in subjective stress experiences and self-efficacy beliefs of preschool teachers in Germany: A longitudinal study during 12 months of the COVID-19 pandemic. *Teaching and Teacher Education, 124,* 104015. https://doi.org/10.1016/j.tate.2023.104015

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Research paper

# Changes in subjective stress experiences and self-efficacy beliefs of preschool teachers in Germany: A longitudinal study during 12 months of the COVID-19 pandemic☆

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## HIGHLIGHTS

COVID-19 pandemic led to a unique situation for preschool teachers and brought new challenges for preschool teachers.
Longitudinal study with 12 measurement time points from September 2020 to August 2021.
Examination of preschool teachers' subjective stress experiences and self-efficacy beliefs during the COVID-19 pandemic.
Subjective stress experiences increased significantly in Phase 3 of the pandemic during the second COVID-19 wave
F0B7 Recommendations for further research of self-efficacy beliefs and pandemic-related research in the field of early childhood education are discussed.

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## ABSTRACT

This study collected monthly data between September 2020 and August 2021 to document the consequences of the COVID-19 pandemic for German preschool teachers during different pandemic phases. This longitudinal study investigated how subjective stress experiences and self-efficacy beliefs of preschool teachers ($N = 279$) change over time and explored associations on the inter- and intraindividual level. We observed phase-specific changes in subjective stress experiences and interindividual differences in change rates, but no systematic increase across the entire study period. Results also highlight self-efficacy beliefs as a resource for preschool teachers, which should be strengthened to better face stress experiences.

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## 1. Introduction

In Spring 2020, the first wave of the COVID-19 pandemic led to a unique and novel situation, with immediate actions taken around the world to limit the spread of the disease, including the closure of preschools (Autorengruppe Corona-KiTa-Studie, 2020a; 2020b; 2021a) and schools (Viner et al., 2020). Many countries, including Germany, implemented infection prevention policies in educational settings based on 7-day incidence rates. Incidence rates changed significantly as a reflection of different COVID waves, resulting in a

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constant shift between closing and re-opening educational institutions (Blum & Dobrotić, 2021).

These significant changes in the working conditions for teachers can be considered a huge challenge and might be associated with an increase in subjective stress experiences.

Little is known about the effect of those changes on preschool teachers, so far. Therefore, we conducted a longitudinal study in Germany to investigate the extent to which preschool teachers' subjective stress experiences and self-efficacy beliefs changed between September 2020 and August 2021, a period that covers different phases of the COVID-19 pandemic (see Fig. 1). We also explored associations between subjective stress experiences and self-efficacy beliefs over time, to inform intervention strategies that might be effective in supporting preschool teachers' well-being during and beyond the pandemic situation.

### 1.1. Preschool teaching as a challenging profession

Various models and definitions of stress are discussed in psychological stress research (Curbow et al., 2000). Following the cognitive-transactional stress model of Lazarus (Lazarus, 1999; Lazarus & Folkman, 1984), stress is understood as a process in which a person reacts to internal or external demands while the resources for coping with it seem limited. Thus, stress occurs when there is a mismatch between the demands individuals are confronted with and their individual coping capacities. The model emphasizes the interactional nature of stress; it assumes a continuous exchange between the person and the environment, at the center of which are cognitive evaluations (Hemming, 2015). Accordingly, it can be assumed that, over time, subjective stress experiences of preschool teachers are influenced by a changing balance between demands and resources.

Preschool teachers' experiences of stress can hamper the quality of their work. Previous research has documented that the psychological load (depression, stress, and emotional exhaustion) of preschool teachers is a key factor associated with teachers' negative responsiveness (Buettner et al., 2016; Jennings & Greenberg, 2009). Various findings support the notion that preschool teacher stress is an important factor affecting the quality of their caregiving behavior and the teacher-child relationship (de Schipper et al., 2009; Zinsser et al., 2013). In addition, working in preschools that are noisy, crowded, unstable, unpredictable, and disorganized appears to lead to more negative interactions between children and preschool teachers (Jeon et al., 2016). In contrast, safe, structured, and organized work environments result in preschool teachers being better able to support children's development and learning (Mashburn et al., 2008). Preschool teachers' work-related stress not only results in greater conflicts with children in the classroom (Whitaker et al., 2015), but also in less active involvement of parents and reduced amount of time invested in teaching social-emotional skills (Fantuzzo et al., 2012). Such results make it clear that preschool teachers' stress experience is an important factor that directly influences children's development.

The central premise of the Job Demands-Resources (JD-R) model, one of the most popular and widely published theoretical frameworks for understanding employee health, stress, and performance, is to define work conditions as guided by either job demands or job resources (Bakker & Demerouti, 2017; Demerouti et al., 2001). Building on the assumptions of the JD-R model, it can be assumed that, over time, preschool teachers' subjective stress experiences are influenced by a changing balance between job demands and resources. Job demands refer to the physical, social, or organizational aspects of the job that require sustained physical or mental effort and are therefore associated with certain physiological and psychological costs. The daily work of preschool teachers is influenced and characterized by numerous job demands, such as poor staff conditions (e.g. understaffing, illness, etc.) that frequently lead to an inadequate teacher-child ratio while time pressure and high expectations from parents also result in conflicts and additional stress (Gewerkschaft Erziehung und Wissenschaft,

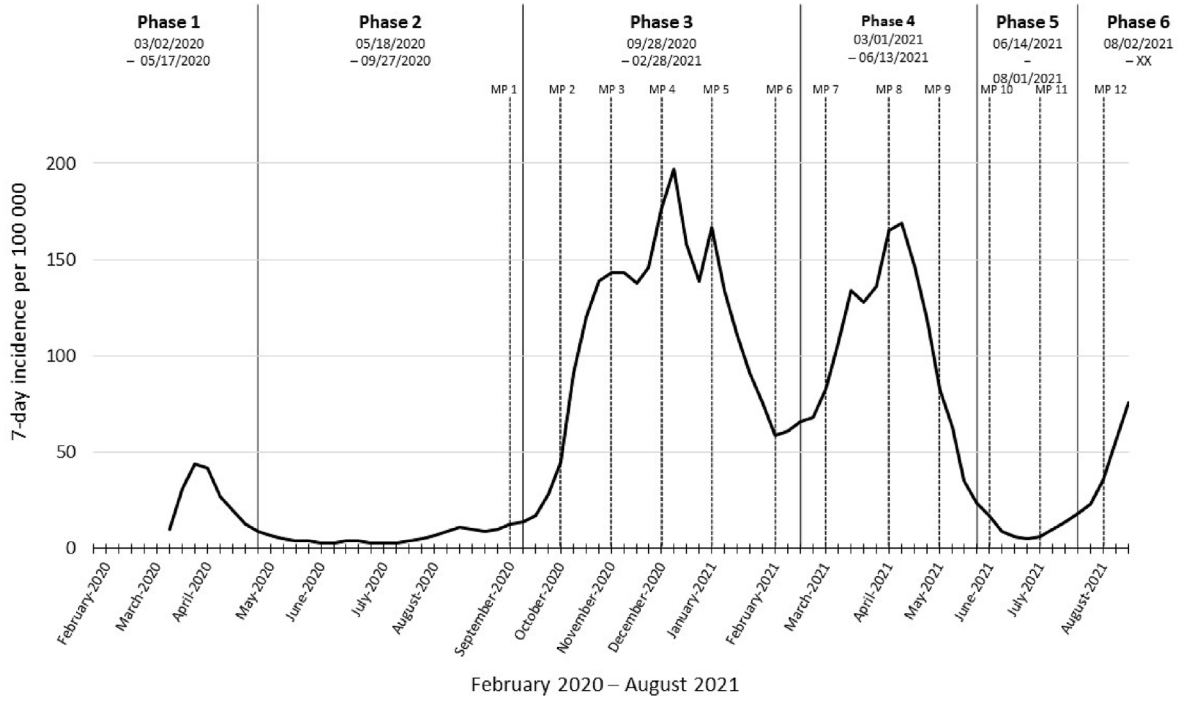


**Fig. 1.** Retrospective classification of phases 1–6 to describe the COVID-19-events in Germany during the time of the data collection for the present study starting in September 2020 (MP 1).

2007; Jungbauer & Ehlen, 2015). The increased effort to tackle the administrative burden of paperwork and required documentation within a limited planning time add to the stressful aspects of the profession (Berger et al., 2001; Gooze, 2014; Raver, 2014; Stipek, 2006). Another main factor of work-related stress among preschool teachers is the perceived lack of control over their job, for example, with regard to time resources and management (Curbow et al., 2000). In summary, the job demands that cause stress for preschool teachers are primarily related to organizational factors but also to characteristics of the interaction with colleagues or parents. In order to cope with these diverse demands, coping capacities are needed which are located at both the organizational and the individual level. Individual resources are psychological characteristics of the self, associated with the ability to control and influence one's own environment (Xanthopoulou et al., 2007). One of these individual resources are self-efficacy beliefs, one's beliefs about one's capabilities to affect one's competence or anxiety in dealing with challenging situations (Skaalvik & Skaalvik, 2007).

### 1.2. Self-efficacy beliefs

Most previous research on self-efficacy beliefs is based on Bandura's social cognitive theory, according to which self-efficacy beliefs constitute a person's beliefs about their capability to organize and execute courses of action required to achieve specific goals (Bandura, 1997). A large body of research focuses on teachers' self-efficacy beliefs as an individual resource, especially in the primary and secondary school context (e.g.Skaalvik & Skaalvik, 2007; Tschannen-Moran & Hoy, 2007). Yet in the early childhood education sector, research on this topic is still scarce (von Suchodoletz et al., 2018).

Following Bandura's theory, self-efficacy beliefs can significantly influence stress management. Individuals with high levels of self-efficacy beliefs consider stressful events to be more controllable and their coping skills to be more stable than individuals with low self-efficacy beliefs (Bandura, 1986). The study by Smidt et al. (2017) showed that occupational self-efficacy beliefs are negatively associated with perceived work-related stress. Accordingly, self-efficacy beliefs are assumed to play a protective role in reducing the number of stressful experiences (Heuven et al., 2006; Schwarzer & Hallum, 2008).

Self-efficacy beliefs are influenced by different sources of information (Bandura, 1997). Among them, mastery experience, which is considered to be the strongest source (Bong & Skaalvik, 2003; Pajares, 1997). For example, self-efficacy beliefs are increased when people perceive their performance as successful, which in turn leads to the belief that future performance will be competent. Vicarious experiences, for example observing the performance of others on certain tasks are also assumed to influence self-efficacy beliefs. Furthermore, verbal persuasion, which involves interactions with others and conversations about other people's or own experiences. The importance of collaboration and collegiality has been shown by prior research (e.g.Guo et al., 2011; Henson, 2001; Klassen et al., 2011; Mulholland & Wallace, 2001; Tschannen-Moran & Hoy, 2007), emphasizing that if there is no opportunity to observe other preschool teachers or to receive peer support and feedback from colleagues as well as parents, they may be deprived a crucial source to help booster self-efficacy beliefs.

All self-efficacy enhancing aspects are linked to personal as well as contextual factors (Skaalvik & Skaalvik, 2007). Differences in these factors may result in interindividual differences in self-efficacy beliefs. In addition, teacher's self-efficacy beliefs change at an intraindividual level depending on situational demands (Zee et al., 2016). Based on prior research and the pandemic-specific challenges, it is reasonable to assume that self-efficacy beliefs of preschool teachers are prone to changing significantly over time. Given the unique working conditions in early childhood education and the limited comparability of findings made among primary and secondary school teachers' self-efficacy beliefs to preschool teachers, it seems important to explore preschool teachers' self-efficacy beliefs during the COVID-19 pandemic.

### 1.3. The COVID-19 pandemic in Germany and the situation in German preschools

To discuss the consequences of the pandemic for preschool teachers in particular, it is important to describe, from a broader perspective, how the pandemic situation evolved in Germany. For the reported analyses, we used the retrospective phase classification of the COVID-19 pandemic by the RKI that divides the pandemic in phases based on various epidemiological parameters (Schilling et al., 2022). The term “Phase” (phase) distinguishes periods of high versus low COVID-activity whereas the term wave refers to periods of high COVID activity only.

The first COVID-19 wave marks the beginning of Phase 1 of the COVID-19 pandemic (03/02/2020–05/17/2020). After implementing comprehensive restrictions on activities at the federal level through a nationwide lockdown, including school and preschool closures, the number of COVID-19 cases decreased.

*Note*. The graph demonstrates the classification of the different pandemic phases as well as the progression of 7-day incidence over the period from February 2020 to August 2021. Some of the data for Phase 1 is not shown in the graph because insufficient testing capacities were available at that time, thereby limiting information regarding actual infection rates. Data for 7-day incidences per 100 000 population are derived from the Robert-Koch-Institute (RKI) (Robert-Koch-Institut, 2020). B MP = measurement point.

During Phase 2 (05/18/2020–09/27/2020), the summer plateau in 2020, all German states reported very low infection rates and lifted restrictions (Schilling et al., 2021). The data collection of the study reported here started in the last week of Phase 2 (09/21/2020–09/27/2020). Phase 3 (09/28/2020–10/04/2020) began with a dynamic infection spread, the second COVID-19 wave at the end of August 2020 in week 09/28/2020–10/04/2020. A further sharp increase in the number of new COVID-19 cases followed in week February 11, 2020–August 11, 2020, resulting in a partial nationwide lockdown while previously lifted restrictions were reintroduced. In December 2020, even stricter public health regulations were implemented. Despite these responses, RKI-reported cases remained at high levels between week 10/26/2020–January 11, 2020 and week 11/16/2020–11/22/2020. In week 12/14/2020–12/20/2020 (still Phase 3), the incidence rate peaked at 210 per 100 000, after which it steadily decreased until week August 02, 2021–02/14/2021 and then stagnated at a high level until week 02/22/2021–02/28/2021 (Schilling et al., 2021). Phase 4 began on January 03, 2021, parallel to the third COVID-19 wave when the rate of new infections spiked again. Over the summer 2021 (06/14/2021–January 08, 2021), cases stagnated for a relatively long time, marking Phase 5 with another summer plateau. The last data reported here was collected during Phase 6, when Germany faced the fourth COVID-19 wave, with higher infection rates than at any other time during the pandemic thus far.

The phases described above had different impacts on the working conditions in German preschools. In Phase 1, shortly after the beginning of the nationwide lockdown (from 03/16/2020), the majority of preschools were closed and only provided emergency care (Autorengruppe Corona-KiTa-Studie, 2020d). This meant that only children with special support needs or children whose parents were working in so-called system relevant sectors were admitted to preschool care (Autorengruppe Corona-KiTa-Studie, 2020a). When

preschools reopened in Phase 2, previously established daily routines generally changed significantly due to the newly implemented hygiene- and health-related measures (including COVID-19-testing at preschool, no parents admitted to the building, food sharing restrictions, etc. …) . Despite lower incidences, when preschools started operating under pandemic conditions, up to 6% of staff could not work in direct contact with children. This was because they either belonged to high-risk groups (i.e., older than 60 years) or were themselves infected with the SARS-CoV-2 virus (Autorengruppe Corona-KiTa-Studie, 2020b), resulting in a significant staff shortage that persisted into Phase 3. In addition, frequent changes in public health regulations due to the continued virulence of the virus hindered a return to pre-pandemic routines and practices. At that time, the proportion of children cared for in preschool relative to the number of children attending preschool prior to the COVID-19 pandemic was 86% (Autorengruppe Corona-KiTa-Studie, 2020b).

As the numbers of COVID-cases were still rising in Phase 3, the federal and state governments decided to close preschools again from December 16, 2020 to January 10, 2021 and only provided emergency care (Autorengruppe Corona-KiTa-Studie, 2021b). As a result of the second nationwide closure of preschools, average attendance rates of preschool children decreased to 50%. Because the nationwide lockdown was extended several times, these low attendance rates remained stable until the end of Phase 3 in February 2021. During this period, about 20% of preschool staff was unable to work or worked with restricted availability due to the pandemic circumstances (Autorengruppe Corona-KiTa-Studie, 2021a). Preschools were allowed to reopen during Phase 4, however, with large regional differences because the reopening was dependent on a 7-day incidence below 100 in the respective state. In Phase 5, most of the preschools returned to regular operation under pandemic conditions. The number of children in preschools initially increased, but then decreased again due to the beginning of the summer vacation time (Autorengruppe Corona-KiTa-Studie, 2020c).

### 1.4. Possible associations between COVID-19 related working conditions and preschool teachers' well-being

Reflecting on the working conditions during each phase, it becomes evident that the COVID-19 pandemic brought new challenges and stressors for preschool teachers. The frequent changes in regulations as well as the closure of preschools represented a possible threat to preschool teachers' well-being. Given the duration and intensity of the pandemic, it is likely that the encountered working conditions turned into additional job stressors for preschool teachers. The pandemic-specific challenges that may have added to stress experiences are likely related to health concerns, the implementation of pedagogical concepts, the exchange between parents and teachers, and administrative burdens related to the new COVID-19-specific regulations.

With regard to health concerns, how contagious and hazardous direct contact with infected children actually was for adults was uncertain for a long time, which placed preschool teachers at a potentially constant risk of catching COVID-19 from children in their classrooms (Badura et al., 2021). Recent studies show that preschool staff were most affected by COVID-19-related sick leaves compared to other professions, such as jobs in the retail sector (where direct human interaction is also common) (Badura et al., 2021). Moreover, the fact that a substantial number of preschool staff belonged to high-risk groups, resulting in stay-at-home orders, led to significant staff shortages and poor staff conditions, which are known to cause stress among preschool teachers (Jungbauer & Ehlen, 2015). Due to new hygiene measures and social distancing regulations, the pedagogical concept needed to be changed from open-group concepts to separated and relatively isolated care with a restricted number of children per teacher. This led to considerable additional organizational time and effort for preschool teachers while interrupting or discontinuing the implementation of pedagogical concepts, in particular open-group concepts that are widely used in German preschools (Autorengruppe Corona-KiTa-Studie, 2020b). Finally, the implementation of hygiene and distancing regulations required extensive documentation, increasing the already large administrative burden on preschool staff (Autorengruppe Corona-KiTa-Studie, 2021a). Preschool teachers might have also perceived the ever-changing regulations as a loss of control.

It is likely that pandemic-related work conditions expose and amplify existing challenges in preschool contexts and, more importantly, add new demands that may lead to an increase in subjective stress experiences among preschool staff. Therefore, it is important to identify factors that buffer the potentially negative effects of the COVID-19 pandemic on preschool teachers' stress experience. Sources that promote self-efficacy beliefs under normal circumstances may have been absent under the pandemic conditions. For example, it was probably more difficult for preschool teachers to implement practices that positively influence children's development. As a result, positive outcomes of success in accordance with a mastery experience may have been seldom or absent. Similarly, in very restrictive phases of the pandemic, the lack of exchange and collaboration within the team and with other colleagues might have limited experiences of verbal persuasion. Vicarious experience, i.e. observing team members while working in an open-group concept, was also impossible due to the restrictions in some pandemic phases (Autorengruppe Corona-KiTa-Studie, 2021a). During Phase 3 and Phase 4 in particular, preschool teachers operated in isolation, limiting teachers' abilities to collaborate with colleagues and resulting in fewer opportunities to receive support when coping with failure and the emotions associated with it. In addition, collaboration and exchange with parents was affected. While prior to the pandemic, direct contact between preschool staff and parents was common, during the pandemic, the communication with parents was done predominately online. Furthermore, parents needed to drop off and pick up their children outside the preschool building, thus limiting opportunities for personal conversations and support that pre-pandemic had been a common and established tool for a successful parent-teacher-partnership (Cohen et al., 2020). Taken together, the situation described above demonstrates the tremendous impact of the COVID-19 pandemic on the working conditions for preschools teachers, carrying the potential to cause an increase in subjective stress experiences while decreasing self-efficacy beliefs.

While several studies examined the burdens of the COVID-19 pandemic on primary and secondary school teachers (e.g.Pressley et al., 2021), only few studies addressed this question in the early childhood education sector. Some studies investigated the situation in German preschools during the pandemic (Andresen et al., 2020; Autorengruppe Corona-KiTa-Studie, 2020a; 2020b; Cohen et al., 2020), however, mainly focusing on the childcare situation, younger children's role in the spread of SARS-CoV-2, the burden on parents and families, or the type of parental involvement. Yet, there has not been a focus on preschool staff, their subjective stress experiences, and individual resources such as self-efficacy beliefs that could minimize the negative impacts of the COVID-19 pandemic.

### 1.5. Goals of the present study

The aim of the current study was to investigate to what extent subjective stress experiences and self-efficacy beliefs of preschool

teachers changed during different phases of the COVID-19 pandemic in Germany and how they were related to one another at an inter- and intra-individual level. It is important to understand how the pandemic-related challenges and stressors not only affect preschool teachers' subjective stress experiences but also their self-efficacy beliefs as those may play a particularly important role when adapting to the uncertain and changing circumstances of the COVID-19 pandemic. We collected longitudinal data during different phases of the COVID-19 pandemic. Multilevel models were used to analyze the data on a between-person (BP) and within-person (WP) level as they fit the structure of the data best and are especially useful for examining changes over time inter- and intra-individually. More specifically, the following research questions were addressed.

(1) To what extent do preschool teachers' subjective stress experiences change during different phases of the COVID-19 pandemic; both on an inter- and intra-individual level?
(2) Do preschool teachers' self-efficacy beliefs remain stable or fluctuate over the period of the study; and do individuals differ over time in the rate of change?
(3) To what extent do preschool teachers' self-efficacy beliefs relate to their subjective stress experiences? Based on prior research (Bandura, 1986; Schwarzer & Hallum, 2008), we expected preschool teachers to report higher levels of self-reported subjective stress experiences when reporting lower self-efficacy beliefs than they would usually have (WP). We also expected that individuals with, on average, lower self-efficacy beliefs have higher levels of subjective stress experiences (BP).

## 2. Method

### 2.1. Sample

In total, 279 preschool teachers ($M$ = 37.65 years, $SD$ = 11.42; 90% female) working in preschools in Germany participated in the study between September 2020 and August 2021. The participants occupied different positions within their preschool, including teachers not leading a preschool group ($n$ = 88), lead teachers ($n$ = 56), and preschool principals ($n$ = 87). Most participants indicated to be from the federal states of Baden-Wuerttemberg ($n$ = 88) and North Rhine-Westphalia ($n$ = 40). Furthermore, 48 participants (16.9%) reported belonging to the group at increased risk for severe COVID-19 disease.

### 2.2. Procedure

We measured subjective stress experiences and self-efficacy beliefs with a monthly online-survey and analyzed 12 measurement points (MP) from September 2020 to August 2021. We started the data collection in Phase 2 of the pandemic with Measurement Point 1. In Phase 3, we had five measurement points, each one month apart (Measurement Points 2–6). In Phase 4, three measurement points took place (Measurement Points 7–9) and Measurement Points 10–11 in Phase 5. Measurement Point 12 was in Phase 6. For every completed monthly questionnaire, participants received a 5€ gift voucher for a shop of their choice. To enhance continued participation, an additional voucher of the same amount was sent out after three successive participations.

Participants were recruited online through research networks and official e-mail addresses of their institutions. Due to ongoing recruitment, participants were able to enter the study at any time. After agreeing to take part in the study, participants completed a baseline questionnaire via SoSci Survey (Leiner & Leiner, 2019) and indicated whether they wanted to be contacted for the monthly surveys via text message (SMS) or Email. Messages with a link to the questionnaire were sent every month around the 15th of each month. The first message of each measurement point was sent out on a Monday; participants who did not respond received a reminder on Wednesday. The survey link expired on Friday. The questionnaire could be completed on the participants' smartphone, tablet, or computer. Since the questions had to be answered repeatedly every month, the questionnaire was developed to be very short. It took participants around 10–15 min to complete the monthly survey.

## 3. Measures

### 3.1. Subjective stress experiences

Subjective stress experiences were assessed with a single-item measure: "*Stress means a situation in which a person feels tense, restless, nervous, or anxious, or is unable to sleep at night because his/her mind is troubled all the time. Do you feel this kind of stress these days?*". The validity of this measure of subjective stress experiences has been supported in previous studies (e.g. Elo et al., 2003). The item was translated to German and the original 5-point Likert scale was transformed to a 7-point rating scale from 1 (*not at all*) to 7 (*quite strongly*).

### 3.2. Self-efficacy beliefs

General self-efficacy beliefs were measured using the Short Scale for Measuring General Self-efficacy Beliefs (ASKU) which is based on three items rated on a scale from 1 (= *doesn't apply at all*) to 5 (= *applies completely*) (Beierlein et al., 2013). Participants' expression and responses on the individual items were averaged. The reliability of the between-person monthly scale means in our study was excellent ($R_{kf}$ = 0.96). The reliability of change was moderate ($R_c$ = 0.62), which may be due to the relatively small number of items (Shrout & Lane, 2012).

### 3.3. Covariates

Previous research found years of experience to be associated with self-efficacy beliefs, however, with inconsistent results (von Suchodoletz et al., 2018; Bullock et al., 2015; Guo et al., 2011; Kim & Kim, 2010). We also found a significant correlation between age and years of experience ($r$ = 0.853, $p$= <.001). Therefore, we controlled for preschool teachers' years of experience working with preschool-aged children as covariate in all our models.

### 3.4. Analytical strategy

Multilevel model analyses were used to account for the nested nature of the data that was hierarchically structured on two levels: repeated measures on Level 1, nested within persons on Level 2 (Mehl & Conner, 2012). Models were built separately for each outcome, respectively for subjective stress experiences and self-efficacy beliefs. Analyses were carried out in R (R Core Team, 2022). To test for interindividual as well as intraindividual fluctuations in subjective stress experiences and self-efficacy beliefs, multilevel models were computed, using the lme4 package.

The sample was cleaned before data analysis. We had link clicks for 284 participants, however five participants stopped answering after the first two questions and did not participate again. The analytical sample therefore consists of 279 participants. Participants were included in the sample when they had completed at least one measurement point. We used pairwise deletion to

account for missing values in our multilevel analyses, thus including only those study occasions where participants had provided responses for all constructs of interest in the respective model. Therefore, some models had to be calculated with fewer data points. Unless otherwise specified, however, the analyses were conducted with the entire sample ($n = 279$). To check whether the calculation of a multilevel model was appropriate, the intraclass correlation coefficients (ICC) of the variables were determined by an unconditional model without predictor variables. The ICC represents how much of the variance stems from the between-person level and thus provides information about the degree of variance according to within-person variation and a residual term (i.e. 1 − ICC).

For all analyses over the entire study period, the 12 months were scaled so that 0 was the value for Month 1 and 1 was the value for Month 12, with the 11 months in between spaced equally across the 0 to 1 interval. To better interpret the results of the phase-specific analyses, we adapted the retrospective phase classification of COVID-19 events in Germany (Tolksdorf et al., 2021). For each phase, the intermediate months were also equally distributed with the last measurement point of the previous phase coded 0 and the last measurement point of the relevant phase coded 1. This scaling of time implies that a linear slope for time estimates the total change in subjective stress experiences and self-efficacy beliefs over the different periods of the study.

The different predictors varied within and between persons; therefore, each variable was split into two predictor variables: (a) the grand-mean centered value across all months for each individual $i$ (between-person association) and (b) the person-mean centered value for each individual $i$ at time $t$ (within-person association).

## 4. Results

### 4.1. Descriptive statistics

The analyzed dataset contained repeated measures of 279 participants who took part in the study with varying frequency ($M = 5.3$ participations per participant, *Range* = 1–12 participations). If all participants would have completed the survey at all measurement points, this would have resulted in 3348 data points. The available data covered 1.362 data points, representing 40.69% of all possible data points. At each time point, the number of participants varied. For this reason, model analyses for the specific study phases were performed with a varying number of participants. The detailed numbers are shown in Tables 1,2 and 3. To test whether there were associations between the number of participations and the study variables, we divided the participants into two groups of low and high participation rate (0 = 0–5 participations, 1 = 6–12 participations). For the variables subjective stress experience, self-efficacy beliefs, position in the institution and professional degree there were no significant differences between the groups. Significant differences in mean work experience were found between the low- and high-participation groups $t(268) = -2.2329$, $p = 0.026$, thus, participants with longer work experience filled out the questionnaire more often.

The descriptive statistics of subjective stress experiences and self-efficacy beliefs are shown in Table 4. Subjective stress experiences were rated moderate, self-efficacy beliefs were rated as relatively high (Table 4). In addition, preschool teachers' subjective experiences of stress and self-efficacy beliefs varied across time (Fig. 2), as well as within participants (Electronic Supplementary Material1). The calculated ICCs ($ICC_{stress} = 0.498$, $ICC_{self\text{-}efficacy\ beliefs} = 0.661$) suggested that 50% of the observed variability for subjective stress experiences was attributable to within-person fluctuations and residual errors. In contrast, for self-efficacy beliefs, only 34% of the observed variance was attributable to within-person variation and residual errors (Fig. 2). Since it can be assumed that the participant's subjective stress experiences varied on the interindividual as well as on the intraindividual level across all measurement time points, the calculation of a multilevel model seemed appropriate.

*Note*. Stress experience was rated on a 7-point scale from 1 (not at all) to 7 (quite strongly). Self-efficacy beliefs were rated on a 5-point scale from 1 (doesn't apply at all) to 5 (applies completely).

#### 4.1.1. Change over time

The first research question addressed the change in subjective stress experiences across the study period and within different pandemic phases (Phase 3, Phase 4, and Phase 5, see above). Therefore, we fitted multilevel models to the data collected across the entire study period from September 2020 to August 2021, as well as separately to the data from the respective pandemic phase, with subjective stress experiences as model outcome. An overview of the results can be seen in Table 2. Considering the entire study period of 12 months, participants showed no significant increase of subjective stress experiences ($b = 0.06$, 95% CI [−0.23; 0.35], $p = .697$), with change rates varying significantly between participants (SD = 1.28, $p = .002$). Regarding the different pandemic phases, participants showed a significant increase of subjective stress experiences within Phase 3 ($b = 0.39$, 95% CI [0.10; 0.68], $p = .009$), but no significant changes within Phase 4 ($b = -0.01$, 95% CI [−0.33; 0.31], $p = .950$) and within Phase 5 ($b = -0.26$, 95% CI [−0.60; 0.07], $p = .119$). Furthermore, while change rates in

**Table 1**
Results from mixed linear models to test the change in subjective stress experiences throughout the entire study period, as well as within specific study phases.

| | Entire study period (Sep 20 – Aug 21) | | | | Phase 3 | | | | Phase 4 | | | | Phase 5 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Estimate* | *p* | *SE* | *CI* | *Estimate* | *p* | *SE* | *CI* | *Estimate* | *p* | *SE* | *CI* | *Estimate* | *p* | *SE* | *CI* |
| **Fixed Effects** | | | | | | | | | | | | | | | | |
| Intercept | 4.06 | .001 | .11 | 3.85–4.27 | 3.86 | .001 | 0.12 | 3.62–4.10 | 4.31 | .001 | 0.13 | 4.06–4.56 | 4.08 | .001 | 0.13 | 3.81–4.34 |
| Time | 0.06 | .697 | .15 | −0.23–0.35 | 0.39 | .009 | 0.15 | 0.10–0.68 | −0.01 | .950 | 0.16 | −0.33–0.31 | −0.26 | .119 | 0.17 | −0.60–0.07 |
| **Random effects** | | | | | | | | | | | | | | | | |
| *Level 2 (between-person)* | | | | | | | | | | | | | | | | |
| Intercept | 1.67 | | | | 1.57 | | | | 1.78 | | | | 1.59 | | | |
| Time[a] | 1.28 | .002 | | | 0.32 | .387 | | | 1.59 | <.001 | | | 0.66 | .482 | | |
| *Level 1 (within-person)* | | | | | | | | | | | | | | | | |
| Residual | 1.27 | | | | 1.35 | | | | 0.88 | | | | 0.96 | | | |
| ICC | 0.52 | | | | 0.49 | | | | 0.65 | | | | 0.62 | | | |
| n/Observations | 279/1376 | | | | 226/715 | | | | 173/501 | | | | 166/337 | | | |

[a] The respective p-value for the level 2 random time effect were obtained by comparing a model with and without the effect via likelihood ratio test.

**Table 2**
Results from mixed linear models to test the change in self-efficacy beliefs throughout the entire study period, as well as within specific study phases.

| | Entire study period (Sep 20 – Aug 21) | | | | Phase 3 | | | | Phase 4 | | | | Phase 5 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Estimate* | *p* | *SE* | *CI* | *Estimate* | *p* | *SE* | *CI* | *Estimate* | *p* | *SE* | *CI* | *Estimate* | *p* | *SE* | *CI* |
| **Fixed Effects** | | | | | | | | | | | | | | | | |
| Intercept | 4.06 | .001 | 0.03 | 3.99–4.12 | 4.10 | .001 | 0.04 | 4.03–4.18 | 4.01 | 0.001 | 0.04 | 3.77–4.16 | 4.04 | .001 | 0.05 | 3.95–4.14 |
| Time | −0.03 | .532 | 0.04 | −0.11–0.06 | −0.10 | .021 | 0.04 | −0.19–−0.02 | 0.03 | 0.551 | 0.04 | −0.06–0.11 | 0.05 | .313 | 0.05 | −0.04–0.14 |
| **Random effects** | | | | | | | | | | | | | | | | |
| *Level 2 (between-person)* | | | | | | | | | | | | | | | | |
| Intercept | 0.19 | | | | 0.22 | | | | 0.19 | | | | 0.24 | | | |
| Time[a] | 0.12 | .001 | | | 0.08 | 0.060 | | | 0.03 | .277 | | | 0.00 | .758 | | |
| *Level 1 (within-person)* | | | | | | | | | | | | | | | | |
| Residual | 0.10 | | | | 0.08 | | | | 0.11 | | | | 0.09 | | | |
| ICC | 0.69 | | | | 0.70 | | | | 0.67 | | | | 0.72 | | | |
| n/Observations | 277/1362 | | | | 224/708 | | | | 173/499 | | | | 164/333 | | | |

[a] The respective p-value for the level 2 random time effect were obtained by comparing a model with and without the effect via likelihood ratio test.

subjective stress experiences varied significantly between participants within Phase 4 (SD = 1.59, $p < .001$), there were no significant interindividual differences in change rates within Phase 3 (SD = 0.32, $p = .387$) and within Phase 5 (SD = 0.66, $p = .482$).

To answer the second research question, we similarly tested a multilevel model with self-efficacy beliefs as model outcome for the entire study period, as well as within each pandemic phase (Table 3). We found no significant linear change in participants' self-efficacy beliefs over the entire duration of the study ($b = -0.03$, 95% CI [−0.11; 0.06], $p = .532$). However, change rates differed significantly between participants (SD = 0.12, $p = .001$). Phase-specific analyses showed that self-efficacy beliefs decreased significantly within Phase 3 ($b = -0.10$, 95% CI [−0.19; −0.02], $p = .021$), and did not change within Phase 4 ($b = 0.03$, 95% CI [−0.06; 0.11], $p = .551$) and Phase 5 ($b = 0.05$, 95% CI [-0-04; 0.14], $p = .313$). Change rates did not differ significantly between participants in any of these phases (all $p > .05$).

### 4.2. Subjective stress experiences, time, and self-efficacy beliefs

The third research question examined the relation of self-efficacy beliefs and subjective stress experiences on both the between-person (interindividual) and the within-person (intra-individual) level. Results from mixed linear modeling are shown in Table 4. The findings show a significant between-person association between subjective stress experiences and self-efficacy beliefs across all measurement points ($b = -0.50$, 95% CI [−0.83; −0.18], $p = .003$). Individuals with higher self-efficacy beliefs than the average study participant reported lower levels of subjective stress experiences. Moreover, self-efficacy beliefs were linked with subjective stress experiences on the within-person level ($b = -0.27$, 95% CI [−0.48; −0.05], $p = <.016$), with participants reporting lower levels of subjective stress experiences at measurement points when they reported higher self-efficacy beliefs than usual. To test whether years of experience could explain additional variance, we added this covariate to the model. Results showed that years of experience did not significantly contribute to the fit of the model.

## 5. Discussion

The purpose of the present study was to examine whether preschool teachers' subjective stress experiences and self-efficacy beliefs changed during different phases of the COVID-19 pandemic in Germany, and whether lower self-efficacy beliefs were related to higher levels of subjective stress experiences, both at the inter- and intra-individual level. Given the many and changing job demands under which preschool teachers were working during the pandemic, we expected elevated levels of preschool teachers' subjective stress experiences and changes in self-efficacy beliefs.

Unexpectedly, in our study, we did not find evidence that teachers' subjective stress experiences increased over the entire study period. Interestingly, another study from Germany also did not find a significant increase in subjective stress experiences during the pandemic among university students (Voltmer et al., 2021). At a first glance, these results may be contradictory to reports revealing the prevalence of elevated stress and mental health problems during the COVID-19 pandemic (Coley & Baum, 2021; Liu et al., 2021). However, despite the fact that the pandemic conditions led to increased stress and mental health problems, notable levels of resilience have been documented suggesting peoples' capacity to manage the psychological challenges of the pandemic (Aknin et al., 2021). More specifically, by summer 2020, levels of psychological distress and mental health problems were decreasing and, in fact, returning to near-pre-pandemic levels

**Table 3**
Mixed linear model to test the within- and between-person association between subjective stress experience and self-efficacy beliefs.

| | Entire study period (Sep 20 – Aug 21) | | | |
|---|---|---|---|---|
| | *Estimate* | *p* | *SE* | *CI* |
| **Fixed Effects** | | | | |
| Intercept | 4.07 | <.001 | 0.11 | 3.86–4.28 |
| Time | 0.02 | .900 | 0.15 | −0.27–0.31 |
| Self-efficacy beliefs, between-person differences | −0.50 | .003 | 0.17 | −0.82–−0.17 |
| Self-efficacy beliefs, within-person fluctuations | −0.26 | .018 | 0.11 | −0.48–−0.04 |
| Years of experience | | .057 | | |
| **Random effects** | | | | |
| *Level 2 (between-person)* | | | | |
| Intercept | 1.63 | | | |
| Time[a] | 1.21 | <.001 | | |
| *Level 1 (within-person)* | | | | |
| Residual | 1.26 | | | |
| n/Observations | 269/1335 | | | |

[a] The respective p-value for the level 2 random time effect were obtained by comparing a model with and without the effect via likelihood ratio test.

**Table 4**
Means, standard deviations, correlations among variables subjective stress experiences and self-efficacy beliefs.

| | | Mean | SD | MISD[c] | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Subjective stress experiences[a] | 4.07 | 1.63 | 1.02 | −.11 | *** | .68 | *** | .66 | *** | .61 | *** | −.06 | | −.17 | *** | −.11 | ** |
| 2. | Self-efficacy beliefs[b] | 4.07 | 0.55 | 0.26 | – | | −.10 | ** | −.08 | * | −.14 | *** | .76 | *** | .79 | *** | .74 | *** |
| 3. | Subjective stress experiences (Phase 3) | 4.14 | 1.63 | 1.00 | | | – | | .71 | *** | .63 | *** | −.10 | ** | −.21 | *** | −.09 | * |
| 4. | Subjective stress experiences (Phase 4) | 4.31 | 1.57 | 0.71 | | | | | – | | .67 | *** | −.04 | | −.17 | *** | −.11 | ** |
| 5. | Subjective stress experiences (Phase 5) | 3.74 | 1.61 | 0.74 | | | | | | | – | | −.10 | ** | −.22 | *** | −.25 | *** |
| 6. | Self-efficacy beliefs (Phase 3) | 4.07 | 0.52 | 0.24 | | | | | | | | | – | | .79 | *** | .71 | *** |
| 7. | Self-efficacy beliefs (Phase 4) | 4.04 | 0.58 | 0.24 | | | | | | | | | | | – | | .85 | *** |
| 8. | Self-efficacy beliefs (Phase 5) | 4.09 | 0.58 | 0.18 | | | | | | | | | | | | | – | |

= p < .05.
= p < .01.
= p < .001.
[a] Stress experience was rated on a 7-point scale from 1 (*not at all*) to 7 (*quite strongly*).
[b] Self-efficacy beliefs were rated on a 5-point scale from 1 (*doesn't apply at all*) to 5 (*applies completely*).
[c] Mean of intraindividual standard deviation.

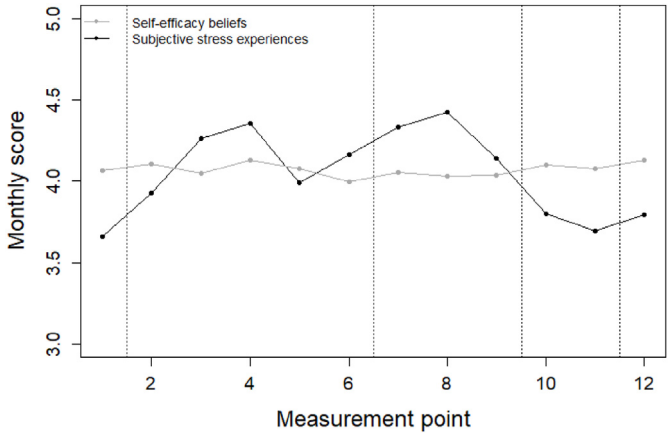


**Fig. 2.** Time course of mean reported subjective stress experiences and self-efficacy beliefs across all 12 measurement points. The dashed lines indicate the different pandemic phases.

(Aknin et al., 2021). Nevertheless, the reports highlight large variation in the impact of the COVID-19 pandemic. This is also reflected in our results. At the beginning of the study (towards the end of Phase 2), the average subjective stress experience was slightly below the median of the scale ($M = 3.66$) although on average it was above the median throughout the study period ($M = 4.07$). In addition, our results suggest that preschool teachers' subjective stress experiences differed depending on the severity of the pandemic-related situation. We found that preschool teachers' subjective stress experiences increased significantly by 0.39 scale points in Phase 3 of the pandemic when preschools were closed again during the second nationwide lockdown and emergency care was imposed. Phase 3 was one of the longest phases, when stable high numbers of infections resulted in multiple extensions of the nationwide lockdown. The constantly adjusted date by the federal government for ending the lockdown brought a lot of uncertainties, including the uncertainty when preschools would reopen, which limited the preschool teachers' ability to adequately plan for emergency care as well as the reopening of their respective preschool without much warning (Autorengruppe Corona-KiTa-Studie, 2021a). Together with the general restrictions due to the pandemic situation during Phase 3, this might have caused an increase in preschool teachers' subjective stress experiences during this period. Importantly, the finding of enhanced subjective stress experiences during Phase 3 was observed for the full sample without significant differences between individuals, suggesting that all participating preschool teachers were similarly negatively affected during this phase. The finding of phase-specific changes in preschool teachers' subjective stress experiences supports the notion that, in line with the transactional stress model (Lazarus, 1999; Lazarus & Folkman, 1984), stress is dynamic in nature.

We also did not find evidence for significant changes in preschool teachers' self-efficacy beliefs over the entire study period. Only a small decrease by −0.10 scale points was observed during Phase 3. These results suggest that sources of self-efficacy beliefs may not have been as strongly influenced by the pandemic circumstances as were subjective stress experiences that significantly increased during Phase 3. It is possible that participants had

learned during the earlier pandemic that they had the capacity to withstand its difficult conditions. Because we used a scale of general self-efficacy beliefs, participants may have related the questions to their life in general and not specifically to the preschool context. As a result, participants might have located sources of self-efficacy beliefs outside the workplace, such as observing others in managing the pandemic restrictions, or talking with family and friends about how to best adapt their lives to the temporary challenges and changes. The use of a scale for general self-efficacy beliefs may have led to the relatively high and stable mean score of 4.07 on a scale of 1–5. Results might have been different if we would have used a measure more specific to preschool teachers' workplace, examining self-efficacy beliefs, for example, in terms of children and classroom characteristics. Prior research documented larger intraindividual than interindividual differences in teachers' self-efficacy beliefs (Zee et al., 2016), suggesting that teachers' self-efficacy beliefs may differ by domain, such as the teachers' ability to manage classroom routines or to support student engagement and learning. It will be important for future research to also include domain-specific self-efficacy beliefs that might be differently affected by the COVID-19 pandemic, especially during periods of preschool closures.

Based on the protective effect of self-efficacy beliefs (Bandura, 1997), we expected that there would be a correlation between self-efficacy beliefs and subjective stress experiences. In line with our assumption, we found both an inter-individual and an intra-individual association of subjective stress experiences and self-efficacy beliefs. Participants with lower self-efficacy beliefs indicated higher subjective stress experiences. This effect was also evident at the intraindividual level. The results align with Bandura's theory, according to which people with great confidence in their abilities deal more effectively with stressors than individuals with lower self-efficacy beliefs. Our findings highlight the importance of strengthening personal resources, such as self-efficacy beliefs to support preschool teachers' well-being and work performance. The results are also consistent with the assumptions of the JD-R model, according to which self-efficacy beliefs are one of the individual resources that can help balance job demands (Bakker & Demerouti, 2007; Xanthopoulou et al., 2007).

## 6. Limitations

The characteristics of the study bear benefits, such as the longitudinal study design with monthly data collected over a one-year period of the COVID-19 pandemic, but also contain some limitations. Emphasizing that the COVID-19 pandemic brought with it many specific circumstances, the results need to be interpreted considering these circumstances. The present data was collected between September 2020 and August 2021; therefore, a comparison with a pre-pandemic situation was not possible. Second, missing data was high. To address the reduction in sample size due to participants dropping out during the study period, we continued with the recruitment of participants as the data was collected. While we were successful in keeping an acceptable sample size for the analyses, this strategy resulted in missing data points for participants who dropped out (missing data on later measurement points) as well as for newly recruited participants (missing data in earlier measurement points) and, consequently, limited statistical power in the analyses. An additional limitation is the possible selectivity of the sample. Participation in the present study was on a voluntary basis. As a result, it is possible that particularly those preschool teachers participated who were able to manage the challenges of the pandemic well and thus felt they had the capacity to participate in the study. In addition, not all states in Germany were equally represented in the sample. We tried to address this possible bias by increasing our recruitment efforts in underrepresented states and through various platforms. Despite great efforts and a relatively high compensation, unfortunately, only a low response rate could be achieved over the length of the study period. We would have hypothesized that our compensation helped to increase the number of participants in the study. Yet, each month a substantial number of participants who took part in the survey chose not to receive compensation ($M$ = 31.6%). A motivation to participate might have been the opportunity to voice one's opinion and concerns and to feel considered. Future studies should address this point in more detail and examine how they can further increase and ensure compliance among the group of preschool teachers, especially considering that participants with more work experience tended to participate more often in the study. Therefore, the results cannot be generalized to the population of preschool teachers in Germany.

For the present study, data was assessed using online questionnaires that could be sensitive to response tendencies and social desirability. In addition, the subjective stress experiences were assessed with a single-item measure, which means that subjective stress experiences could not be measured as precisely and differentiated as in a multi-item measurement. Nevertheless, the measurement can be considered as suitable for our study because (1) it has been validated for monitoring stress in different work-related contexts (Elo et al., 2003) and (2) had a positive effect on the length of the questionnaire, since Drolet and Morrison (2001) were able to demonstrate, especially in longitudinal studies, filling out long questionnaires is a high burden for the respondents. Considering the number of existing stressors and those that have been added by the pandemic, it is important to include these stress-inducing factors in future research. To increase the objectivity of the measurement, a more intensive measure, such as a physiological measurement of the stress reaction, is conceivable in addition to the subjective assessment. Self-efficacy beliefs were also measured with a short scale (Beierlein et al., 2013), for ecological reasons. For further research, it would be desirable to include a situation-specific or preschool teacher-specific measurement of the construct. Finally, in addition to specific self-efficacy beliefs as an individual resource, personality traits could be included as explanatory individual variables in future studies. The results of different studies show that personality traits were the most important predictors of various burnout dimensions compared to contextual and demographic variables. The highest burnout scores were found primarily among teachers and preschool teachers with high neuroticism and high introversion (Cano-García et al., 2005; Kokkinos & Davazoglou, 2005).

## 7. Implications and conclusion

The present study is one of the few that collected longitudinal data over many measurement points during the COVID-19 pandemic. The results suggest that preschool teachers' subjective stress experiences may be differentially affected by the pandemic conditions, depending on the specific, pandemic-related circumstances. With the still ongoing COVID-19 pandemic, it will be important to continue examining the mental health and well-being of preschool teachers. Subjective stress experiences may rise again during longer phases of high pandemic activity, as we have shown during Phase 3. Phase 3 was accompanied by a high staff shortage, as some of the preschool teachers were only able to work to a limited extent (Autorengruppe Corona-KiTa-Studie, 2021a). Previous studies have shown that added tasks to the workload of the remaining teachers to overcome staff shortages are experienced as particularly stressful (Losch & Schulze, 2016). It can therefore be assumed that the pandemic has further intensified stress.

Interventions to reduce stress may be critical to support preschool teachers to stay engaged in their work while reducing the risk for burnout. For example, mindfulness practices have been shown successful in reducing stress among preschool teachers which, in turn, can enhance teachers' use of supportive teaching practices (Braun et al., 2019; Jennings, 2015). The results also point to self-efficacy beliefs as a personal resource with the potential to buffer negative impacts of the COVID-19 pandemic on preschool teachers' well-being. Thus, strengthening preschool teachers' self-efficacy beliefs may be another avenue in supporting their well-being. In addition, it is important to provide preschool teachers with help in developing methods for coping with stress and challenges. Ideally, such strategies should be flexible so that they can easily be adapted in times when circumstances change rapidly, such as during the different phases of the COVID-19 pandemic. Therefore, it will be important to integrate elements of psycho-education in the pre-service and in-service teacher training in order support the mental health among preschool teachers. In the context of in-service training, Bray-Clark and Bates (2003) pointed out that early childhood education staff professional development standards should address the sources of and processes for enhancing self-efficacy beliefs. For preschool teachers, strategies such as peer coaching, collegial support groups, mentoring, study groups, and audio and video recordings are recommended. It is possible to strengthen individual resources through prevention and intervention efforts to reduce stress. In the future, it will be important to not only address demands and resources at the individual but also at the organizational level.

The present findings are a first important step in examining the impact of the COVID-19 pandemic on preschool teachers. Even though surveys of this kind may represent an additional burden for preschool teachers, it will be critical to continue research efforts to better understand the specific situation of preschool teachers and how they can be supported in delivering high-quality early childhood education services despite challenging circumstances.

## Data availability

Data will be made available on request.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.tate.2023.104015.

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# Appendix C: Manuscript 2

**Steigleder, J.,** Buhr, L., Ehm, J. H., Gawrilow, C., & von Suchodoletz, A. (2025). Pandemic-related threats and well-being: A longitudinal study of preschool teachers in Germany during the COVID-19 pandemic. *Early Childhood Research Quarterly*, *70*, 320-333. https://doi.org/10.1016/j.ecresq.2024.11.001

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Research Paper

# Pandemic-related threats and well-being: A longitudinal study of preschool teachers in Germany during the COVID-19 pandemic

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ABSTRACT

Working conditions in the field of early childhood education and care (ECEC) changed significantly during the COVID-19 pandemic. To understand how these changes affected preschool teachers, a longitudinal study was conducted in Germany from September 2020 to February 2022, a period that covers different phases of the global health crisis. Multilevel models were used to observe phase-specific changes and to test whether preschool teachers' emotion regulation strategies moderated relationships between COVID-19 infection threat, economic threat, affective well-being, and COVID-19 related mental strain. A total of 388 preschool teachers ($M$ = 37.54 years) participated in the online survey study ($M$=4.78 out of max. 16 participations). Results highlighted phases of higher and lower COVID-19 related threat perception and showed associations between perceived infection and economic threat and affective well-being and mental strain. Findings indicated that the extent of cognitive reappraisal and expressive suppression moderated the associations between COVID-19 infection threat and positive affect, as well as the association between economic threat and mental strain. Phase-specific changes and differences in change rates were discussed in the context of potential prevention and intervention measures.

## 1. Introduction

In recent years, research attention in the field of early childhood education and care (ECEC) has shifted towards examining working conditions and work quality particularly focusing on preschool teachers' mental health (Whitaker et al., 2015). The onset of the COVID-19 pandemic significantly altered job demands and expectations for preschool teachers. They faced repeated phases of uncertainty, lack of planning opportunities, increased risk of infection, and restrictions on regular childcare services. Consequently, fear of infection and actual COVID-19 infections resulted in staff shortages among preschool teachers, prompting the closure of classes, groups or entire facilities (Kuger et al., 2022), placing financial strain on preschools and their employees (National Association for the Education of Young Children, 2020). Recent empirical findings indicate that preschool teachers reported increased stress and mental strain throughout the COVID-19 pandemic (Berger et al., 2022; Keleynikov et al., 2022). However, a notable gap in the literature persists as there is currently no longitudinal evidence assessing the long-term impact of the pandemic on preschool teachers' affective well-being and mental health during the COVID-19 pandemic.

Addressing this gap, the current study assessed preschool teachers' perception of COVID-19 related threats, affective well-being, and mental strain over an 18-month period. The primary goal was to deepen the understanding of how preschool teachers' perceptions evolved during specific phases of the COVID-19 pandemic and whether individual differences existed in change rates between preschool teachers. Given that the COVID-19 pandemic is viewed as a multidimensional and potentially

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toxic stressor associated with mental health issues in the general population in Germany (Brakemeier et al., 2020), we sought to investigate how COVID-19 related threats, such as infection and economic threat, influenced the affective well-being and mental strain of preschool teachers. Furthermore, previous research indicates that individuals with higher cognitive reappraisal are less likely to experience distress under adverse conditions, while those who tend to suppress emotions often report higher mental strain (San Too & Butterworth, 2018). Therefore, a secondary goal of the study was to explore whether interindividual differences in emotion regulation (ER) strategies (cognitive reappraisal and expressive suppression) moderated the associations between infection or economic threat and affective well-being and COVID-19 related mental strain at the between- and within-person levels.

### 1.1. ECEC during the pandemic

To assess the impact of the COVID-19 pandemic on preschool teachers, an understanding of the pandemic situation is crucial, especially in the context of German preschools where participants for the current study were recruited. The retrospective phase classification by the Robert Koch Institute[1] provides a valuable framework for describing the dynamic course of the COVID-19 pandemic, distinguishing between phases of high and low COVID-19 activity. Fig. 1 shows nationwide incidences and retrospectively describes COVID-19-related events in Germany from March 2020 to May 2022 during various epidemiological phases of the pandemic, as determined by Tolksdorf et al. (2022). A COVID-19 wave refers to a period of high COVID-19 activity characterized by a rapid increase in incidence rates. However, given that the timeline of political restrictions related to the COVID-19 pandemic varied considerably across different states, regions, and institutions in Germany, we provide a general overview of the political restrictions and developments in the ECEC field along the retrospective phase classification (see Table 1). The German early childhood education system's emphasis on in-person interactions and play-based learning made it challenging to adapt to remote teaching methods, in contrast to countries like the US, where distance learning was more extensively explored and adapted for various educational levels (Ford et al., 2021). Given the significant role of care and staff-child interactions in German early childhood education, where direct engagement and care are fundamental to pedagogical goals, distance learning was largely unfeasible and was to our knowledge not implemented in German daycare centers during the pandemic (Neuberger et al., 2023). This information helps contextualize the impact of the pandemic on the affective and mental well-being of preschool teachers in Germany. The unpredictable nature of the COVID-19 pandemic made it difficult to predict its course, potentially causing unforeseen consequences for preschool teachers. In particular the different phases of the pandemic, some with low infection rates and others with high infection rates, might have led to changes in how threats related to the pandemic have been perceived as threats by preschool teachers.

#### 1.1.1. COVID-19-related threats to preschool teachers

The course of the COVID-19 pandemic exacerbated already high work demands placed on preschool teachers (Schreyer et al., 2015). One of the most pressing was the job-related exposure to the virus itself. When looking at perception of hazard, two components have been distinguished: Loss of control (the fear of catastrophic potential) and unknown risk (an unobservable hazard) (Peters & Slovic, 1996; Siegrist et al., 2005). Due to the fact that the focus is on affective rather than cognitive appraisal of hazards, risk perception usually causes emotions and induces feelings of stress (Loewenstein et al., 2001).

This approach to risk perception can be applied to preschool teachers' experience during the pandemic. By activating these two components – emotion and stress – preschool teachers may have felt personally threatened by the virus. Early on in the pandemic, it wasn't clear how contagious direct contact with infected children would be for adults, which exposed preschool teachers to a constant risk of becoming infected (Neuberger et al., 2022). Several studies have already connected fear of infection from interacting with children to anxiety among preschool teachers (Keleynikov et al., 2022). The fear of infection, referred to in the present study as "COVID-19 infection threat" (IT), was significantly stronger at the workplace compared to other settings (Kuger et al., 2022). The concern is not unsubstantiated; various surveys by German health insurance companies reported that preschool staff in childcare centers were among the occupational groups at highest risk for COVID-19 infection (Meyer et al., 2021).

Another potential threat was related to preschool teacher's income. Low pay and associated financial strain is a considerable problem among the ECEC workforce in Germany, even before the pandemic (Schreyer et al., 2015), and is linked to teacher turnover, burnout, reduced developmentally-appropriate practices, and poor quality of instruction (Al-Adwan & Al-Khayat, 2017; Whitebook & Sakai, 2003). Despite the recognition of the importance of high-quality ECEC and the growing need for qualified preschool staff, the average pay for full-time preschool teachers in Germany is lower than the average income of the general population (Hipp et al., 2017), placing a substantial financial burden on preschool staff (Schreyer et al., 2015). Recent evidence suggests that pre-pandemic financial strains increased among preschool teachers as the pandemic evolved (Swigonski et al., 2021). This could be due to lower child enrollment rates during the COVID-19 pandemic, which led to reduced work hours and, as a consequence, lower salaries (Kwon et al., 2022). In the present study, "economic threat" (ET) refers to stress factors associated with the subjective feeling that one's financial situation is perceived as jeopardized.

### 1.2. Preschool teachers' affective well-being and mental health

In the literature, increased attention has been paid to the well-being and mental health of preschool teachers, recognizing their pivotal role in shaping the quality of ECEC and their interactions with children in the classroom (Whitaker et al., 2015). Lower levels of well-being have been linked to preschool teachers' lack of responsiveness towards children (Buettner et al., 2016). According to Diener et al. (1995), subjective well-being consists of an affective and a cognitive component. Affective well-being is defined as the prevalence of positive affect (PA) over negative affect (NA). Given that this component of subjective well-being is influenced by factors such as work climate, quality of work environments, and relationships with colleagues (Whitaker et al., 2015), it is crucial to explore mechanisms aimed at improving affective well-being among preschool teachers. Prior to the pandemic, preschool teachers reported experiencing high levels of stress, burnout, and lower levels of well-being (Johnson et al., 2020; Whitaker et al., 2015). The emergence of the COVID-19 pandemic introduced a new, multidimensional stressor with the potential to threaten their mental health (Brakemeier et al., 2020). The additional demands faced by preschool teachers (Berger et al., 2022; Swigonski et al., 2021) may have led to phase-specific changes in their well-being and higher levels of mental strain. According to Lazarus and Folkman (1984), people who lack sufficient resources to respond to and successfully cope with stressors (or threats) are at a heightened risk for negative psychological consequences. There is evidence that people respond emotionally to perceived risk, suggesting that the threat of a COVID-19 infection has the potential to induce emotions and cause mental strain (Loewenstein et al., 2001). Furthermore, COVID-19-specific threats, such as risk perception, have been associated with reductions in well-being (Han et al., 2021), which is consistent with

[1] The Robert Koch Institute (RKI) is the leading public health institute in Germany, responsible for monitoring, assessing, and controlling infectious diseases. During the COVID-19 pandemic, the RKI played a crucial role in providing guidance, conducting research, and disseminating information to the public and healthcare professionals.

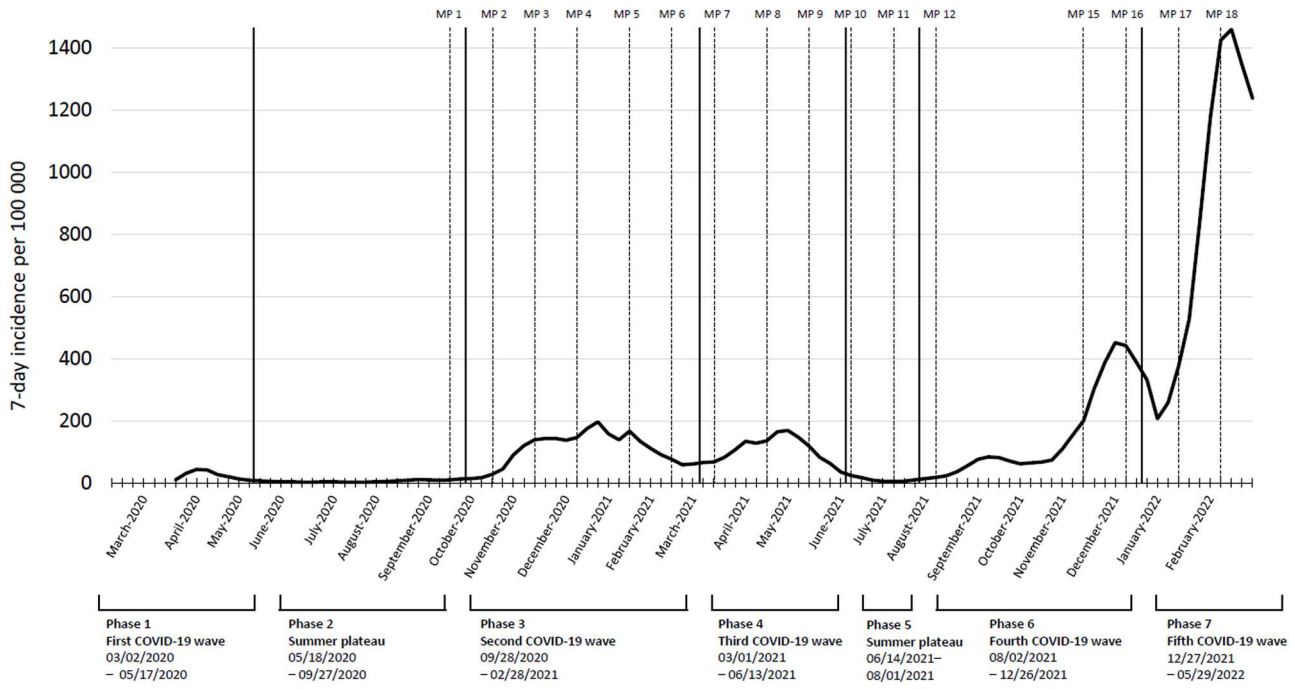


**Fig. 1.** Retrospective phase classification of COVID-19 in Germany.
*Note.* Data collection for the study was originally planned for one year, as the end of the pandemic was unpredictable. When it became apparent that the pandemic would last longer in the summer of 2021, the study was extended, requiring new ethical approval and additional funding, resulting in a two-month break in data collection to create the necessary conditions deemed unavoidable for scientific integrity.

findings from previous pandemics (Prati et al., 2011). Similarly, evidence suggests that perceived economic threats are related to stress experience and mental strain (Brakemeier et al., 2020; Selenko & Batinic, 2011). Thus, based on these research findings, it is reasonable to assume that pandemic-related threats might have negatively impacted the affective well-being and COVID-19 related mental strain of preschool teachers.

### *1.3. Emotion regulation strategies*

When demands or stressors induce an "affective response", ER strategies enable individuals to reduce, maintain, or increase their emotions (Gross, 2013). According to Gross (2013), people use two general strategies to regulate their emotions. The first is "cognitive reappraisal", an antecedent-focused ER strategy in which emotion-eliciting situations are reappraised before the emotion is aroused. The second is "expressive suppression", a response-focused regulation strategy where emotional tendencies are suppressed or inhibited once the emotion has already occurred. Studies indicate that cognitive reappraisal is a personal resource that refers to an individual's ability to control their emotions efficiently and to adapt to their environment (Han et al., 2020; Yin et al., 2016). In contrast, suppression is a personal demand that reflects an individual's inability to cope with the emotionally demanding environment. While some individuals tend to reappraise the situation and others tend to suppress the emotion, the choice of ER strategy can have an impact on one's subjective well-being. In the literature, increased cognitive reappraisal use is often associated with positive emotions and well-being, while expressive suppression is associated with poorer interpersonal functioning and a negative impact on well-being (Gross & John, 2003). Moreover, the influence of stressful events on positive and negative effects on well-being are likely to be less severe when individuals have abilities to cope with emotions associated with stressful situations (Lazarus & Folkman, 1984). ER is viewed as a dynamic perspective that considers the fit between situational demands, individual goals, and the choice of ER strategy (Wenzel et al., 2022). Research also suggests stable differences between people regarding the use of strategies. However, most retrospective self-survey studies report limitations, such as memory biases. To circumvent this problem, the present study assessed measures across different measurement points to represent the average use of the strategies (Schwarz, 2012).

## 2. Present study

In this study, we adopted a longitudinal approach to address the research gap on the pandemic impacts on the field of ECEC, left by predominantly cross-sectional or pre-post design studies. Through our longitudinal design, we aimed to understand how preschool teachers' perceptions evolved across various phases of the COVID-19 pandemic, focusing on pandemic-related threats, affective well-being, and COVID-19 related mental strain. Capturing stability, changes and interindividual change rates over time is crucial for understanding how preschool teachers' perceptions adapted to pandemic circumstances and whether they remained consistent. This exploration is essential for determining if strategic adjustments to working conditions should be tailored to individual needs or could be universally applied. Such interventions could potentially minimize mental strain of preschool teachers during future crises, reducing staff absenteeism and facility closures due to acute staff shortages (Autorengruppe Fachkräftebarometer, 2023).

Additionally, gaining a comprehensive understanding of how pandemic-related threats, including COVID-19 infection threat and economic threat, have affected preschool teachers' affective well-being and mental strain is essential, as the pandemic has amplified pre-existing stressors present in the regular work environment. This investigation provides valuable insights into the dynamics within the pandemic context, offering pathways for long-term improvements in the work environment, which will ultimately enable professionals to provide quality educational care to children. By additionally exploring the moderating role of ER strategies, it may be possible to provide a basis for improving teacher well-being through intrapersonal coping mechanisms. Building upon prior literature on the experiences of preschool teachers during the COVID-19 pandemic, we addressed three specific research questions:

**Table 1**
Overview of restrictions in Germany's ECEC field during the COVID-19 pandemic.

| Description | Restrictions at preschool and general level | Effects on preschools and teachers |
|---|---|---|
| Phase 1 First COVID-19 wave (03/02/20 – 05/17/20) | First COVID-19-related lockdown, preschool and school closure, emergency care only for critical infrastructure workers.[1] | Childcare occupancy rates 10-30%, and significant staff shortages began to emerge.[1,2] |
| Phase 2 Summer plateau 2020 (05/18/20 – 09/27/20) | Gradually lifting of restrictions, preschools open with strict hygiene and social distance regulations.[1] | Up to 8% of teachers are unable to work in direct contact with children, due to an infection or belonging to the high-risk group for a serious course of disease.[1] |
| Phase 3 Second COVID-19 wave (09/28/20 – 02/28/21) | Partial lockdown and reimplementation of restrictions, nationwide lockdown, preschool closures with emergency care for critical infrastructure workers only. Repeated extension of the national lockdown. Changes in practice due to hygiene and social distance rules, such as changes in group concepts.[1] | 20% of teachers were unable to work.[1, 3] 40% of directors reported infection fears.[1, 3] Difficulties in implementing infection prevention measures, due to staff shortages.[1] |
| Phase 4 Third COVID-19 wave (03/01/21 – 06/13/21) | Introduction of regional incidence rule, reopening of preschools. Increase in kindergarten occupancy and withdrawal of infection prevention measures, followed by nationwide lockdown and third closure phase of preschools. | Nearly 43% of preschool teachers reported infection concerns.[1] |
| Phase 5 Summer plateau 2021 (06/14/21 – 08/01/21) | Regular preschool openings under pandemic conditions, some infection prevention measures lifted.[4] | 17% of preschool teachers reported fear of infection.[1] |
| Phase 6 Fourth COVID-19 wave (08/02/21 – 12/26/21) | Infection prevention measures (group separation, testing of employees, wearing of FFP2 mask) reintroduced; closures implemented at the group level, not at the preschool level.[1] | Proportion of preschool staff who could not be deployed or only indirectly (through supporting work outside the group) due to COVID-19 increased to 7%.[1] |
| Phase 7 Fifth COVID-19 wave (12/27/21 – 05/29/2022) | Preschools kept open with protective measures and testing approaches, comparable to Phase 6.[5] | Dramatic increase in staff unavailability of up to 21%, not only related to COVID-19 infections, but also related to other respiratory diseases. 50% of the preschool directors reported no fear of infection.[1] |

*Note.* [1]Kuger et al. (2022), [2]Autorengruppe Corona-KiTa-Studie (2020), [3]Autorengruppe Corona-KiTa-Studie (2021), [4]Autorengruppe Corona-KiTa-Studie (2022), [5]Neuberger et al. (2022)

1. How did preschool teachers' perceptions of COVID-19-related threats evolve during phases of high (Phase 3, 4, 6 and 7; see Fig. 1) and low (Phase 5) COVID-19 activity? Were preschool teachers' perceptions consistent or were there interindividual differences in change rates?
2. How did preschool teachers' affective well-being and COVID-19-related mental strain evolve during phases of high and low COVID-19 activity? Were preschool teachers' perceptions consistent or were there interindividual differences in change rates?
3. How did interindividual differences in ER strategies moderate the relationship between COVID-19 related threats and affective well-being, mental strain, respectively?

Guided by the retrospective phase classification of COVID-19 (RKI, 2022) we hypothesized increased COVID-19 infection threat during phases of high COVID-19-activity and a decrease during phases of low COVID-19 activity (*H1a*), with consistent interindividual change rates (*H1b*). Similar hypotheses were formulated for economic threat (*H2a, H2b*). We also anticipated a decline in preschool teachers' affective well-being during high COVID-19-activity and an increase during phases of low COVID-19 activity (*H3a*), with consistent interindividual change rates (*H3b*). Concerning COVID-19-related mental strain, we predicted an increase within phases of high COVID-19-activity and a decrease within phases of low COVID-19 activity (*H4a*), with consistent interindividual change rates (*H4b*).

Furthermore, we hypothesized that individuals with higher average cognitive reappraisal experienced weaker associations (*H5a*) between COVID-19 related threats and affective well-being, COVID-19 related mental strain, respectively. Moreover, we expected individuals with higher average levels of expressive suppression to experience a stronger association (*H5b*) between COVID-19 related threat and affective well-being, COVID-19 related mental strain, respectively. To contribute to a better understanding of these dynamics, this study examined the respective moderations at the between- and within-person levels, assessing the effects of COVID-19 related threats on affective well-being and mental strain over time and specific measurement points.

## 3. Material and methods

### 3.1. Sample

In total, 388 German preschool teachers ($M$ = 37.54 years, $SD$ = 11.54, 84.79% female) participated between September 2020 and February 2022. Participants held different positions, including preschool directors ($n$ = 70), lead teachers ($n$ = 116), and teachers ($n$ = 115). 58 participants (14.95%) reported being at higher risk for severe COVID-19 complications. This risk was particularly present in individuals of older age, with pre-existing diseases, or insufficient immune protection (RKI, 2022). Further participant demographics can be found in the Supplemental Material (SM 1).

### 3.2. Procedure

The study covered an 18-month period, starting in September 2020 after the first COVID-19 wave, with participants completing monthly online surveys. Initially planned for one year due to uncertain pandemic duration and limited funding, data collection was extended when the pandemic persisted beyond summer 2021. Due to the extension, an amendment to the ethics vote and additional funding were necessary, leading to a two-month break in data collection in October and November 2021. Detailed information on measurement points and COVID-19 phases is shown in Fig. 1. Each completed survey earned participants a 5 Euro gift voucher, with an additional voucher awarded after three consecutive completions. Recruitment took place online through the first authors' university research network and publicly available institutional email addresses of preschools in Germany. Continuous recruitment allowed participants to enter the study at any time with survey links sent out in the middle of each month.

### 3.3. Measures

#### 3.3.1. COVID-19 infection threat

COVID-19 infection threat was assessed using five items on a 5-point Likert scale (1 = *low risk*, 5 = *high risk*). These items included subjective risk perceptions of contracting COVID-19 (Han et al., 2021), uncertainty about pandemic consequences, and health concerns (adapted from Tan & 2020). The monthly scale mean reliability[2] between individuals was

[2] To test reliability, the factor structure of the scales was examined using the lavaan 0.6-11 package in R (R Core Team, 2022).

excellent ($R_{kf}$ = .95), while within-person reliability was moderate ($R_c$ = .38).

#### 3.3.2. Economic threat

We assessed perceived economic threat using a three-item measure of financial strain (Selenko & Batinic, 2011) on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Between-person reliability was $R_{kf}$ .94, and within-person reliability was $R_c$ =.40.

#### 3.3.3. Affective well-being

The adapted version of the Positive and Negative Affect Schedule scale (PANAS; Russell, 1980) assessed positive (6 items) and negative affect (5 items) on a 5-point Likert scale (1 = *very slightly or not at all*, 5 = *extremely*).Between-person monthly scale mean reliability in our study was excellent ($R_{kf}$ (PA) = .95; $R_{kf}$ (NA) = .93), and within-person reliability was moderate ($R_c$ (PA) = .76; $R_c$ (NA) = .53).

#### 3.3.4. COVID-19-related mental strain

COVID-19-related mental strain was measured with a single-item: "How much mental strain are you experiencing related to the COVID-19 pandemic?" The item was rated on a 5-point Likert scale (1 = *not at all*, 5 = *very*).

#### 3.3.5. Emotion regulation strategies

We used the German version of the Emotional Regulation Questionnaire (Abler & Kessler, 2009) by Gross and John (2003) to assess cognitive reappraisal (CR) and expressive suppression (ES) as emotion regulation strategies. The questionnaire comprised 10 items rated on a 5-point Likert scale (1 = *do not agree*, 5 = *fully agree*). Between-person reliability was excellent ($R_{kf}$ (CR) = .92; $R_{kf}$ (ES) = .93), while within-person reliability was moderate ($R_c$ (CR) = .42; $R_c$ (ES) = .53).

#### 3.3.6. Covariates

We controlled for covariates such as age, gender, years of experience in the profession, and neuroticism based on conceptual assumptions (Cano-García et al., 2005; Klassen & Chiu, 2010). Neuroticism, recognized for its predictive role in influencing emotional reactions and well-being (McCrae & Costa Jr, 2008; Ng & Diener, 2009), was assessed using an adapted subscale from the short version of the Big Five Inventory (BFI-S; Hahn et al., 2012), comprising three items reflecting participants' self-perceptions regarding worry, ease of becoming nervous, and ability to handle stress. Between-person reliability was excellent ($R_{kf}$ = .96), while within-person reliability was moderate ($R_c$ = .44). See SM 2 for the German version of items for all measures. Preliminary analysis of our data showed that neuroticism remained stable over time, which supports its classification as a stable personality trait (Hahn et al., 2012).

### 3.4. Data analysis

To assess reliability of the scales, we calculated multilevel confirmatory factor analyses (MCFA) for combined scales (see SM 3), with standardized factor loadings at both between-person (Level 2) and within-person (Level 1) levels interpreted using guidelines by Hu and Bentler (1999).

#### 3.4.1. Data cleaning

The initial dataset consisted of 1,978 data points from 397 survey respondents. First, we assessed whether each individual responded to at least 50% of the items within each scale at a specific measurement point. If this criterion was met, we computed the mean score for the scale. Otherwise, the responses to the individual items were excluded and designated as missing values (NAs). Participants' data were included even if data was available for only one of the examined variables, as we focused on whether the individual variables changed or remained stable over time. Secondly, to ensure all data could be used in the multilevel models, missing age and years of experience data were imputed by the mean. Following data cleaning, the final data set consisted of 1,855 data points from 388 individuals. Simulation studies (Maas & Hox, 2005) show that in multilevel models, the number of participants (level-2) is more important than the overall sample size, with repeated measures (level-1) compensating for fewer participants. Maas and Hox (2005) found that only very small level-2 samples (fewer than 50 participants) result in biased standard errors, leading us to consider our sample size adequate for multilevel analysis.

#### 3.4.2. Modeling procedure

We used the lme4 package in R (R Core Team, 2022) to fit mixed linear models (Bolger & Laurenceau, 2013) for the nested structure of the data, organized hierarchically at two levels: repeated measures on Level 1 nested within persons on Level 2. Two values were created for each variable: (a) $x_i$ representing the value centered over all months for each person $i$ (between-persons association) and (b) $x_{it}$ representing the value centered over all persons for each person $i$ at time $t$ (within--persons association).

Intraclass correlation coefficients (ICC) were computed using an unconditional model without predictor variables to evaluate the suitability of multilevel model calculations.

To account for missing data in our multilevel models, we applied pairwise deletion, which allowed us to include participants with complete data for the constructs of interest in each respective model. This method minimized the exclusion of valid cases, ensuring that the statistical power was not unduly compromised. While our aim was to conduct analyses using the entire sample of 388 participants whenever feasible, the number of participants varied across mixed linear models due to data availability, which was explicitly noted in the models.

To address Research Questions 1 and 2, we utilized the retrospective phase classification of COVID-19 events (Tolksdorf et al., 2022) to analyze changes within each COVID-19 phase. The time variable indicated the estimated change in each COVID-19 phase, centered with the last measurement point of the previous phase (coded as 0) and the last measurement point of the investigated phase (coded as 1), with equal intervals for the intermediate months. Mixed linear models were constructed separately for each variable (COVID-19 infection threat, economic threat, affective well-being, COVID-19-related mental strain) for each COVID-19 phase (Phase 3 – 7) to examine changes over time (*H1-H4*).

$$\text{Level 1}: \; OUTCOME_{it} = \beta_{0t} + \beta_{it} phase_{it} + e_{it}$$

$$\text{Level 2}: \; \beta_{0t} = \gamma_{00} + \gamma_{01} gender_i + \gamma_{02} age_i + \gamma_{03} experience_i + \gamma_{04} neur_i + u_{0t}$$

$$\beta_{it} = \gamma_{10} + u_{1t}$$

To answer Research Question 3, we analyzed the data over the entire study period. The time variable indicated the estimated change between the first measurement point (MP 1, coded as 0) and the last measurement point (MP 18, coded as 1) with equal intervals for the 17 months in between. Linear models tested hypotheses *H5* and *H6*, with separate models for affective well-being and COVID-19-related mental strain. Predictor variables included COVID-19 infection threat and economic threat, while ER strategies[3] served as moderator variables.

$$Level\ 1: OUTCOME_{it} = \beta_{0t} + \beta_{1t} predictor_{it} + e_{it}$$

$$Level\ 2: \; \beta_{0t} = \gamma_{00} + \gamma_{01} predictor_i + \gamma_{02} predictor \times CR_i + \gamma_{03} predictor \times ES_i + \gamma_{04} gender_i + \gamma_{05} age_i + \gamma_{06} experience_i + \gamma_{07} neur_i + u_{0t}$$

[3] CR = cognitive reappraisal, ES = expressive suppression

$$\beta_{1t} = \gamma_{10} + \gamma_{11}CR_i + \gamma_{12}ES_i$$

To assess the robustness and to minimize confounding effects across all analyses, we controlled for covariates as age, gender, years of experience, and neuroticism.

## 4. Results

### 4.1. Descriptive statistics

The analytical sample included repeated measurements from 388 participants with varying participation frequencies ($M$ = 4.78 participations per person, *Range* = 1-16), resulting in 1,855 data points out of 6,208 possible data points (assuming full participation at all 16 measurement points), with a compliance rate of 29.88%. Descriptive statistics, including ICCs and correlations were examined across the entire study period and each pandemic phase (see SM 4, Tables E1 – E6).

### 4.2. Stability and change over time

We used mixed linear models to examine patterns of stability and change across phases of high (Phase 3, 4, 6, 7) and low (Phase 5) COVID-19 activity. Level 1 (within-person) captured intraindividual changes over time, while Level 2 (between-person) described interindividual change rates. Results for *H1-H4* are outlined in Table 2 and Table 3, while plots of phase-specific changes are presented in SM 5.

#### 4.2.1. COVID-19 infection threat

We analyzed COVID-19 infection threat across different phases of the COVID-19 pandemic. In Phase 3, results showed a significant increase ($\beta$ = 0.33, 95% CI [0.23, 0.43], $p$ <.001), with varying interindividual change rates ($SD$ = 0.26, $p$ < .001). Conversely, Phase 4 showed a decrease in infection threat ($\beta$ = -0.14, 95% CI [-0.25, -0.04], $p$ = .007), with consistent change rates between participants ($SD$ = 0.30, $p$ = .188), indicating the sample did not deviate from the typical slope. In Phase 5, infection threat decreased ($\beta$ = -0.24, 95% CI [-0.35, -0.12], $p$ < .001), with consistent change rates ($SD$ = 0.25, $p$ = .237). However, Phase 6 showed a significant increase in infection threat ($\beta$ = 0.21, 95% CI [0.08, 0.34], $p$ = .002), with varying change rates ($SD$ = 0.40, $p$ = .008), indicating deviation from the typical slope. Phase 7 showed no significant changes in infection threat ($\beta$ = -0.05, 95% CI [-0.16, 0.05], $p$ = .305), with consistent change rates between participants ($SD$ = 0.22, $p$ = .119).

#### 4.2.2. Economic threat

Likewise, we examined changes in economic threat across pandemic phases. In Phase 3, economic threat remained stable ($\beta$ = 0.01, 95% CI [-0.14, 0.15], $p$ = .926), with consistent interindividual change rates ($SD$ = 0.36, $p$ = .080). Phase 4 showed a significant decrease ($\beta$ = -0.15, 95% CI [-0.28, -0.03], $p$ = .020), with no variability in change rates ($SD$ = 0.00, $p$ = 1). Similarly, Phase 5 showed a decrease in economic threat across all participants ($\beta$ = -0.25, 95% CI [-0.41, -0.09], $p$ = .002), with no differences in change rates ($SD$ = 0.00, $p$ = 1). Conversely, Phase 6 exhibited a significant increase in economic threat among all participants ($\beta$ = 0.43, 95% CI [0.25, 0.60], $p$ <.001), with varying change rates ($SD$ = 0.57, $p$ <.001). In Phase 7 economic threat remained stable across all participants ($\beta$ = 0.01, 95% CI [-0.15, 0.18], $p$ = .892), with differing change rates ($SD$ = 0.65, $p$ < .001).

#### 4.2.3. Affective well-being

We examined affective well-being for each pandemic phase separately. In Phase 3 preschool teachers experienced a significant decrease in positive affect ($\beta$ = -0.25, 95% CI [-0.39, -0.11], $p$ = .001) and an increase in negative affect ($\beta$ = 0.24, 95% CI [0.10, 0.37], $p$ = .001). Significant interindividual differences in change rates of affective well-being were observed (PA: $SD$ = 0.55, $p$ = .002, NA: $SD$ = 0.52, $p$ <.001). In Phase 4 positive and negative affect remained stable (PA: $\beta$ = -0.03, 95% CI [-0.15, 0.09], $p$ = .637, NA: $\beta$ = -0.09, 95% CI [-0.21, 0.03], $p$ = .161), with consistent change rates (PA: $SD$ = 0.39, $p$ = .066, NA: $SD$ = 0.33, $p$ = .199). In Phase 5 a significant increase in positive affect as well as a significant decrease in negative affect were observed (PA: $\beta$ = 0.27, 95% CI [0.14, 0.40], $p$ <.001, NA: $\beta$ = -0.21, 95% CI [-0.36, -0.05], $p$ = .010), with consistent change rates between participants (PA: $SD$ = 0.00, $p$ = .941, NA: $SD$ = 0.40, $p$ = .327). In Phase 6, positive affect decreased significantly ($\beta$ = -0.33, 95% CI [-0.47, -0.19], $p$ <.001), while negative affect increased significantly ($\beta$ = 0.31, 95% CI [0.16, 0.46], $p$ <.001), with consistent change rates between participants (PA: $SD$ = 0.30, $p$ = .253, NA: $SD$ = 0.33, $p$ = .067). Phase 7 showed a significant increase in positive affect, but negative affect remained stable (PA: $\beta$ = 0.16, 95% CI [0.02, 0.29], $p$ = .021, NA: $\beta$ = -0.10, 95% CI [-0.23, 0.03] $p$ = .125). Interindividual change rates in positive affect differed significantly, while consistent change rates in negative affect were observed (PA: $SD$ = 0.36, $p$ = .039, NA: $SD$ = 0.28, $p$ = .447).

#### 4.2.4. COVID-19-related mental strain

We further examined mental strain during each pandemic phase. Phase 3 revealed a significant increase in mental strain ($\beta$ = 0.56, 95% CI [0.38, 0.73], $p$ <.001), with consistent interindividual change rates ($SD$ = 0.32, $p$ = .611). In Phase 4 mental strain remained stable across participants ($\beta$ = -0.15, 95% CI [-0.34, 0.04], $p$ = .126), with no differences in interindividual change rates ($SD$ = 0. 45, $p$ = .534). Conversely, Phase 5 showed a significant decrease in mental strain ($\beta$ = -0.28, 95% CI [-0.47, -0.08], $p$ = .007), with varying change rates ($SD$ = 0.10, $p$ = .037). Phase 6 showed a significant increase in mental strain ($\beta$ = 0.44, 95% CI [0.20, 0.68], $p$ <.001), with consistent change rates between participants ($SD$ = 0.49, $p$ = .204). Phase 7 indicated that mental strain remained stable ($\beta$ = -0.08, 95% CI [-0.24, 0.09], $p$ = .356), with varying change rates ($SD$ = 0.42, $p$ = .043).

### 4.3. COVID-19-related threats and affective well-being

A series of multilevel models examined associations between COVID-19-related threats and affective well-being at both between- and within-person levels (Table 4). A negative between-person association was found between COVID-19 infection threat and positive affect ($\beta$ = -0.13, 95% CI [-0.22; -0.04], $p$ = .005), alongside a positive association with negative affect ($\beta$ = 0.34, 95% CI [0.25; 0.43], $p$ <.001). Within-person, infection threat was negatively related to positive affect ($\beta$ = -0.18, 95% CI [-0.25; -0.11], $p$ <.001) and positively related to negative affect ($\beta$ = 0.25, 95% CI [0.18 0.32], $p$ <.001).

Similarly, economic threat also related to affective well-being. Between-person, economic threat was negatively associated with positive affect ($\beta$ = -0.07, 95% CI [-0.14; -0.01], $p$ = .034), and positively associated with negative affect ($\beta$ = 0.23, 95% CI [0.17; 0.30], $p$ <.001). Within-person, economic threat again negatively affected positive affect ($\beta$ = -0.08, 95% CI [-0.13; -0.03], $p$ = .001), while positively relating to negative affect ($\beta$ = 0.09, 95% CI [0.04; 0.14], $p$ <.001). Neuroticism, as a covariate, negatively affected positive affect and positively influenced negative affect, indicating that individuals with higher neuroticism experience lower positive and greater negative emotions. In contrast, the other covariates gender, age, and years of experience, showed no significant effects.

### 4.4. COVID-19-related threats and mental strain

Next, we examined the associations between COVID-19 infection threat (or economic threat) and mental strain at both the between- and within-person levels using a series of multilevel models (Table 5). A positive association was found between infection threat and mental strain at both levels: between-person ($\beta$ = 0.93, 95% CI [0.80; 1.06], $p$ <.001;) and within-person ($\beta$ = 0.61, 95% CI [0.52; 0.71], $p$ <.001). Similarly, economic threat was positively related to mental strain at

**Table 2**
Results from multilevel models to test the change in COVID-19 infection and economic threat throughout the entire study period and within specific study phases.

| | | Phase 3 | | | | Phase 4 | | | | Phase 5 | | | | Phase 6 | | | | Phase 7 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* |
| **COVID-19 infection threat** | **Fixed Effects** | | | | | | | | | | | | | | | | | | | | |
| | Intercept | 3.00 | <.001 | 0.23 | 2.55 – 3.45 | 3.22 | <.001 | 0.27 | 2.69 – 3.76 | 3.28 | <.001 | 0.30 | 2.68 – 3.88 | 2.87 | <.001 | 0.23 | 2.37 – 3.36 | 3.33 | <.001 | 0.28 | 2.78 – 3.87 |
| | Time | 0.33 | <.001 | 0.05 | 0.23 – 0.43 | -0.14 | .007 | 0.05 | -0.25 – -0.04 | -0.24 | <.001 | 0.06 | -0.35 – -0.12 | 0.21 | .002 | 0.12 | 0.08 – 0.34 | -0.05 | .305 | 0.05 | -0.16 – 0.05 |
| | **Random effects** | | | | | | | | | | | | | | | | | | | | |
| | *Level 2 (BP)* | | | | | | | | | | | | | | | | | | | | |
| | Intercept | 0.30 | | | | 0.31 | | | | 0.34 | | | | 0.42 | | | | 0.31 | | | |
| | Time[a] | 0.07 | <.001 | | | 0.09 | .188 | | | 0.06 | .237 | | | 0.16 | .008 | | | 0.05 | .119 | | |
| | *Level 1 (WP)* | | | | | | | | | | | | | | | | | | | | |
| | Residual | 0.11 | | | | 0.12 | | | | 0.10 | | | | 0.08 | | | | 0.11 | | | |
| | n/ Observations | 212/ 678 | | | | 167/ 481 | | | | 156/ 322 | | | | 209/ 371 | | | | 150/ 346 | | | |
| | | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* |
| **Economic threat** | **Fixed Effects** | | | | | | | | | | | | | | | | | | | | |
| | Intercept | 3.03 | <.001 | 0.32 | 2.41 – 3.65 | 2.89 | <.001 | 0.37 | 2.17 – 3.61 | 2.86 | <.001 | 0.40 | 2.08 – 3.64 | 2.04 | <.001 | 0.34 | 1.38 – 2.71 | 3.04 | <.001 | 0.35 | 2.36 – 3.73 |
| | Time | 0.01 | .926 | 0.08 | -0.14 – 0.15 | -0.15 | .020 | 0.07 | -0.28 – -0.03 | -0.25 | .002 | 0.08 | -0.41 – -0.09 | 0.43 | <.001 | 0.09 | 0.25 – 0.60 | 0.01 | .892 | 0.08 | -0.15 – 0.18 |
| | **Random effects** | | | | | | | | | | | | | | | | | | | | |
| | *Level 2 (BP)* | | | | | | | | | | | | | | | | | | | | |
| | Intercept | 0.66 | | | | 0.51 | | | | 0.51 | | | | 0.63 | | | | 0.61 | | | |
| | Time[a] | 0.13 | .080 | | | 0.00 | 1 | | | 0.00 | 1 | | | 0.33 | <.001 | | | 0.42 | <.001 | | |
| | Level 1 (WP) | | | | | | | | | | | | | | | | | | | | |
| | Residual | 0.28 | | | | 0.26 | | | | 0.25 | | | | 0.11 | | | | 0.16 | | | |
| | n/ Observations | 214/ 680 | | | | 167/ 478 | | | | 155/ 319 | | | | 210/ 370 | | | | 148/ 343 | | | |

Notes.
[a] The respective p-value for the level 2 random time effect were obtained by comparing a model with and without the effect via likelihood ratio test.
[b]BP = between-person level: grand mean-centered; WP = within-person level: person mean-centered.

**Table 3**
Results from multilevel models to test the change in affective well-being and COVID-19-related mental strain throughout the entire study period and within specific study phases.

| | | Phase 3 | | | | Phase 4 | | | | Phase 5 | | | | Phase 6 | | | | Phase 7 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *B* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* |
| **Positive Affect** | **Fixed Effects** | | | | | | | | | | | | | | | | | | | | |
| | Intercept | 3.04 | <.001 | 0.21 | 2.63 – 3.45 | 2.72 | <.001 | 0.27 | 2.20 – 3.25 | 2.75 | <.001 | 0.25 | 2.24 – 3.26 | 3.24 | <.001 | 0.24 | 2.77 – 3.70 | 2.79 | <.001 | 0.24 | 2.31 – 3.26 |
| | Time | -0.25 | .001 | 0.07 | -0.39 – -0.11 | -0.03 | .637 | 0.06 | -0.15 – 0.09 | 0.27 | <.001 | 0.07 | 0.14 – 0.40 | -0.33 | <.001 | 0.07 | -0.47 – -0.19 | 0.16 | .021 | 0.07 | 0.02 – 0.29 |
| | **Random effects** | | | | | | | | | | | | | | | | | | | | |
| | *Level 2 (BP)* | | | | | | | | | | | | | | | | | | | | |
| | Intercept | 0.28 | | | | 0.34 | | | | 0.21 | | | | 0.25 | | | | 0.34 | | | |
| | Time[a] | 0.30 | .002 | | | 0.15 | .066 | | | 0.00 | .941 | | | 0.00 | .253 | | | 0.13 | .039 | | |
| | *Level 1 (WP)* | | | | | | | | | | | | | | | | | | | | |
| | Residual | 0.20 | | | | 0.17 | | | | 0.22 | | | | 0.17 | | | | 0.19 | | | |
| | n/ Observations | 225/707 | | | | 174/501 | | | | 168/336 | | | | 221/ 396 | | | | 157/ 367 | | | |
| | | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *B* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* |
| **Negative Affect** | **Fixed Effects** | | | | | | | | | | | | | | | | | | | | |
| | Intercept | 2.46 | <.001 | 0.21 | 2.05 – 2.87 | 3.06 | <.001 | 0.28 | 2.51 – 3.62 | 2.66 | <.001 | 0.27 | 2.14 – 3.18 | 2.46 | <.001 | 0.24 | 1.99 – 2.92 | 2.95 | <.001 | 0.28 | 2.41 – 3.49 |
| | Time | 0.24 | .001 | 0.07 | 0.10 – 0.37 | -0.09 | .161 | 0.06 | -0.21 – 0.03 | -0.21 | .010 | 0.08 | -0.36 – -0.05 | 0.31 | <.001 | 0.08 | 0.16 – 0.46 | -0.10 | .124 | 0.07 | -0.23 – 0.03 |
| | **Random effects** | | | | | | | | | | | | | | | | | | | | |
| | *Level 2 (BP)* | | | | | | | | | | | | | | | | | | | | |
| | Intercept | 0.21 | | | | 0.38 | | | | 0.27 | | | | 0.20 | | | | 0.37 | | | |
| | Time[a] | 0.27 | <.001 | | | 0.11 | .199 | | | 0.16 | .327 | | | 0.11 | .067 | | | 0.08 | .447 | | |
| | Level 1 (WP) | | | | | | | | | | | | | | | | | | | | |
| | Residual | 0.19 | | | | 0.20 | | | | 0.23 | | | | 0.20 | | | | 0.19 | | | |
| | n/ Observations | 222/710 | | | | 174/ 506 | | | | 167/335 | | | | 221/392 | | | | 157/363 | | | |
| | | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | *B* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* |
| **Mental strain** | **Fixed Effects** | | | | | | | | | | | | | | | | | | | | |
| | Intercept | 2.84 | <.001 | 0.38 | 2.10 – 3.57 | 3.90 | <.001 | 0.43 | 3.06 – 4.73 | 3.80 | <.001 | 0.05 | 2.87 – 4.76 | 3.06 | <.001 | 0.38 | 2.32 – 3.81 | 4.03 | <.001 | 0.41 | 3.22 – 4.84 |
| | Time | 0.56 | <.001 | 0.09 | 0.38 – 0.73 | -0.15 | .126 | 0.10 | -0.34 – 0.04 | -0.28 | .007 | 0.10 | -0.47 – -0.08 | 0.44 | <.001 | 0.12 | 0.20 – 0.68 | -0.08 | .356 | 0.08 | -0.24 – 0.09 |
| | **Random effects** | | | | | | | | | | | | | | | | | | | | |
| | *Level 2 (BP)* | | | | | | | | | | | | | | | | | | | | |
| | Intercept | 0.80 | | | | 0.68 | | | | 0.75 | | | | 0.80 | | | | 0.69 | | | |
| | Time[a] | 0.10 | .611 | | | 0.20 | .534 | | | 0.01 | .037 | | | 0.24 | .204 | | | 0.18 | .043 | | |
| | Level 1 (WP) | | | | | | | | | | | | | | | | | | | | |
| | Residual | 0.44 | | | | 0.47 | | | | 0.40 | | | | 0.53 | | | | 0.26 | | | |
| | n/ Observations | 214/ 687 | | | | 168/ 485 | | | | 156/ 325 | | | | 211/ 378 | | | | 153/ 352 | | | |

Note.
[a] The respective p-value for the level 2 random time effect were obtained by comparing a model with and without the effect via likelihood ratio test.
[b]BP = between-person level: grand mean-centered; WP = within-person level: person mean-centered.

**Table 4**
Parameter coefficients and standard errors from multilevel modeling examining infection and economic threat predicting affective well-being: Investigating moderating level-2 factors.

| | Positive Affect | | | | Negative Affect | | | | | Positive Affect | | | | Negative Affect | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *β* | *p* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* | | *β* | *P* | *SE* | *95% CI* | *β* | *p* | *SE* | *95% CI* |
| **Fixed Effects** | | | | | | | | | Fixed Effects | | | | | | | | |
| Intercept | 2.99 | <.001 | 0.15 | 2.70 – 3.28 | 2.67 | <.001 | 0.15 | 2.38 – 2.96 | Intercept | 2.99 | <.001 | 0.15 | 2.69 – 3.28 | 2.68 | <.001 | 0.15 | 2.39 – 2.97 |
| Infection threat *(BP)* | -0.13 | .005 | 0.05 | -0.22 – -0.04 | 0.34 | <.001 | 0.05 | 0.25 – 0.43 | Economic threat *(BP)* | -0.07 | .034 | 0.03 | -0.14 – -0.01 | 0.23 | <.001 | 0.03 | 0.17 – 0.30 |
| Infection threat *(WP)* | -0.18 | <.001 | 0.04 | -0.25 – -0.11 | 0.25 | <.001 | 0.04 | 0.18 – 0.32 | Economic threat *(WP)* | -0.08 | .001 | 0.02 | -0.13 – -0.03 | 0.09 | <.001 | 0.02 | 0.04 – 0.14 |
| Reappraisal | 0.01 | . 827 | 0.05 | -0.09 – 0.11 | 0.04 | .409 | 0.05 | -0.06 – 0.14 | Reappraisal | 0.03 | .661 | 0.05 | -0.08 – 0.12 | 0.06 | .247 | 0.05 | -0.04 – 0.16 |
| Suppression | 0.09 | .028 | 0.04 | 0.01 – 0.17 | -0.02 | .630 | 0.04 | -0.10 – 0.06 | Suppression | 0.09 | .036 | 0.04 | 0.01 – 0.17 | -0.05 | .191 | 0.04 | -0.14 – 0.03 |
| Gender | 0.01 | .804 | 0.05 | -0.08 – 0.11 | 0.05 | .313 | 0.04 | -0.05 – 0.15 | Gender | 0.02 | .763 | 0.05 | -0.08 – 0.11 | 0.04 | .465 | 0.05 | -0.06 – 0.13 |
| Age | -0.00 | .463 | 0.00 | -0.01 – 0.01 | 0.00 | .020 | 0.00 | -0.02 – 0.00 | Age | -0.00 | .458 | 0.00 | -0.01 – 0.01 | -0.01 | .021 | 0.00 | -0.02 – -0.00 |
| Years of experience | -0.00 | .695 | 0.00 | -0.01 – 0.01 | 0.00 | .747 | 0.00 | -0.01 – 0.01 | Years of experience | -0.00 | .727 | 0.00 | -0.01 – 0.01 | 0.00 | .545 | 0.00 | -0.01 – 0.01 |
| Neuroticism | -0.25 | <.001 | 0.04 | -0.32 – -0.17 | 0.29 | <.001 | 0.04 | -0.22 – 0.36 | Neuroticism | -0.25 | <.001 | 0.04 | -0.33 – -0.18 | 0.31 | <.001 | 0.04 | 0.23 – 0.38 |
| Infection threat *(BP) X* Reappraisal *(BP)* | 0.17 | .020 | 0.07 | 0.03 – 0.31 | -0.06 | .388 | 0.07 | -0.20 – 0.08 | Economic threat *(BP) X* Reappraisal *(BP)* | 0.02 | .749 | 0.06 | -0.10 – 0.14 | -0.01 | .844 | 0.06 | -0.13 – 0.11 |
| Infection threat *(WP) X* Reappraisal *(BP)* | 0.04 | .579 | 0.08 | -0.11 – 0.19 | 0.07 | .385 | 0.08 | -0.08 – 0.21 | Economic threat *(WP) X* Reappraisal *(BP)* | 0.01 | .804 | 0.05 | -0.08 – 0.11 | 0.00 | .925 | 0.05 | -0.09 – 0.10 |
| Infection threat *(BP) X* Suppression *(BP)* | -0.12 | .046 | 0.06 | -0.24 – 0.00 | 0.05 | .413 | 0.06 | -0.07 – 0.17 | Economic threat *(BP) X* Suppression *(BP)* | 0.01 | .780 | 0.05 | -0.08 – 0.11 | -0.00 | .946 | 0.05 | -0.10 – 0.09 |
| Infection threat *(WP) X* Suppression *(BP)* | -0.03 | .640 | 0.06 | -0.14 – 0.09 | -0.08 | .165 | 0.06 | -0.20 – 0.03 | Economic threat *(WP) X* Suppression *(BP)* | -0.04 | .366 | 0.04 | -0.11 – 0.04 | -0.03 | .448 | 0.04 | -0.11 – 0.05 |
| **Random effects** | | | | | | | | | | | | | | | | | |
| *Level 2 (BP)* | | | | | | | | | | | | | | | | | |
| Intercept | 0.18 | | | | 0.18 | | | | Intercept | 0.19 | | | | 0.18 | | | |
| *Level 1 (BP)* | | | | | | | | | | | | | | | | | |
| Residual | 0.25 | | | | 0.25 | | | | Residual | 0.25 | | | | 0.25 | | | |
| n/ Observations | 358/ 1700 | | | | 358/ 1701 | | | | n/ Observations | 359/ 1695 | | | | 359/ 1697 | | | |

Note. BP = between-person level: grand mean-centered; WP = within-person level: person mean-centered.

**Table 5**
Parameter coefficients and standard errors from multilevel modeling examining infection and economic threat predicting mental strain: Investigating moderating level-2 factors.

| | Mental strain | | | | | Mental strain | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *β* | *p* | *SE* | *95% CI* | | *β* | *p* | *SE* | *95% CI* |
| **Fixed Effects** | | | | | **Fixed Effects** | | | | |
| Intercept | 3.03 | <.001 | 0.22 | 2.61 – 3.46 | Intercept | 3.18 | <.001 | 0.25 | 2.68– 3.68 |
| Infection threat *(BP)* | 0.93 | <.001 | 0.07 | 0.80 – 1.06 | Economic threat *(BP)* | 0.42 | <.001 | 0.06 | 0.30 – 0.53 |
| Infection threat *(WP)* | 0.61 | <.001 | 0.05 | 0.52 – 0.71 | Economic threat *(WP)* | 0.19 | <.001 | 0.04 | 0.12 – 0.26 |
| Reappraisal | -0.07 | .372 | 0.08 | -0.21 – 0.08 | Reappraisal | -0.01 | .921 | 0.09 | -0.18 – 0.16 |
| Suppression | -0.06 | .330 | 0.06 | -0.18 – 0.06 | Suppression | -0.16 | .025 | 0.07 | -0.29 – -0.02 |
| Gender | 0.11 | .117 | 0.07 | -0.03 – 0.26 | Gender | 0.11 | .187 | 0.08 | -0.05 – 0.28 |
| Age | -0.00 | .807 | 0.01 | -0.01 – 0.01 | Age | -0.01 | .447 | 0.01 | -0.02 – 0.01 |
| Years of experience | 0.01 | .166 | 0.01 | -0.00 – 0.02 | Years of experience | 0.01 | .084 | 0.01 | -0.00 – 0.03 |
| Neuroticism | 0.08 | .147 | 0.06 | -0.03 – 0.19 | Neuroticism | 0.18 | .005 | 0.06 | 0.06 – 0.31 |
| Infection threat *(BP) X* Reappraisal *(BP)* | 0.04 | .671 | 0.10 | -0.16 – 0.25 | Economic threat *(BP) X* Reappraisal *(BP)* | 0.00 | .985 | 0.10 | -0.20 – 0.20 |
| Infection threat *(WP) X* Reappraisal *(BP)* | -0.14 | .165 | 0.10 | -0.35 – 0.06 | Economic threat *(WP) X* Reappraisal *(BP)* | -0.23 | .001 | 0.07 | -0.36 – -0.09 |
| Infection threat *(BP) X* Suppression *(BP)* | -0.03 | .758 | 0.09 | -0.20 – 0.15 | Economic threat *(BP) X* Suppression *(BP)* | -0.17 | .035 | 0.08 | -0.33 – -0.01 |
| Infection threat *(WP) X* Suppression *(BP)* | 0.07 | .373 | 0.08 | -0.08 – 0.23 | Economic threat *(WP) X* Suppression *(BP)* | 0.12 | .030 | 0.06 | 0.01 – 0.23 |
| **Random effects** | | | | | | | | | |
| *Level 2 (BP)* | | | | | | | | | |
| Intercept | 0.41 | | | | Intercept | 0.60 | | | |
| *Level 1 (BP)* | | | | | | | | | |
| Residual | 0.48 | | | | Residual | 0.51 | | | |
| n/ Observations | 362/ 1731 | | | | | 363/ 1725 | | | |

Note. BP = between-person level: grand mean-centered; WP = within-person level: person mean-centered.

both levels: between-person ($\beta = 0.42$, 95% CI [0.30; 0.53], $p < .001$) and within-person ($\beta = 0.19$, 95% CI [0.12; 0.26], $p < .001$). Neuroticism, as a covariate, was positively associated with mental strain, indicating that individuals with higher neuroticism experienced greater mental strain, while the other covariates showed no significant effects.

### 4.5. Moderating effects of emotion regulation strategies

#### 4.5.1. Cognitive reappraisal

Mixed linear models indicated that cognitive reappraisal moderated several associations between COVID-19-related threats (infection threat and economic threat) and affective well-being as well as mental strain. Notably, participants with lower average cognitive reappraisal experienced a stronger negative between-person relationship between COVID-19 infection threat and positive affect compared to those with higher levels of cognitive reappraisal ($\beta = 0.17$, 95% CI [0.03; 0.31], $p = .020$).

In terms of mental strain, cognitive reappraisal also served as a moderator. At the within-person level, participants with lower average cognitive reappraisal experienced higher mental strain linked to perceived economic threat compared to those with higher levels ($\beta =$ -0.23, 95% CI [-0.36; -0.09], $p = .001$). No further evidence supported the moderation of other associations by cognitive reappraisal.

#### 4.5.2. Expressive suppression

In the same models, expressive suppression moderated some associations between COVID-19-related threats and both affective well-being and mental strain. First, individuals with higher levels of expressive suppression showed a stronger negative between-person association between COVID-19 infection threat and positive affect compared to those with lower levels of suppression ($\beta =$ -0.12, 95% CI [-0.24; 0.00], $p = .046$).

In terms of mental strain, no moderation effects were identified for the association with COVID-19 infection threat. However, the positive between-person association between economic threat and mental strain was weaker among individuals with higher average expressive suppression ($\beta =$ -0.17, 95% CI [-0.33; -0.01.], $p = .035$). Conversely, the positive within-person association between economic threat and mental strain was stronger for those with higher levels of expressive suppression ($\beta = 0.12$, 95% CI [0.01; 0.23.], $p = .030$). No additional moderation effects of expressive suppression were observed.

## 5. Discussion

The COVID-19 pandemic can be regarded as a multidimensional and potentially toxic stressor that significantly affected employees across various sectors (Brakemeier et al., 2020). This study highlights how the unpredictable course of the pandemic is reflected in preschool teachers' perceptions. Results demonstrate a link between COVID-19 related threats and poorer affective well-being, alongside increased mental strain. Additionally, the importance of ER strategies is underscored, with cognitive reappraisal and expressive suppression partly moderating these associations. Unlike previous research in the ECEC field, which primarily relied on cross-sectional or pre-post study designs, this study spans an 18-month period, providing valuable insights into trends and relationships.

### 5.1. Stability and change in COVID-19 related threats

Research Question 1 highlighted the varying effects of the COVID-19 pandemic on preschool teachers during phases of low and high COVID-19 activity, shedding light on its impact on the ECEC workforce. Specifically, COVID-19 infection threat increased in Phases 3 and 6 (high activity), supporting *H1a*. In contrast, *H1b* could not be confirmed for these phases, indicating differences in preschool teachers' perceptions during phases of low activity, potentially influenced by characteristics of preschool centers such as size and staffing, as prior research has shown (Kuger et al., 2022). While preschool teachers experienced a significant increase of infection threat in Phase 3, they also demonstrated a brief recovery in Phase 4 and 5, maintaining a consistent decrease in perception of infection threat. This contrasts with studies suggesting habituation to pandemic anxiety (Costa et al., 2022), given that the perception of infection threat rose again across all preschool teachers in Phase 6.

Changes in infection threat are partly reflected in the perception of economic threat. Specifically, Phase 6 showed an increase in economic threat, confirming *H2a*. This rise may be attributed to preschool teachers feeling inadequately compensated for their increased workload and associated risks as the pandemic progressed over various month. During Phase 6, the variability in change rates of economic threat among participants disproved *H2b*, potentially reflecting differences in employment conditions. Preschool teachers faced diverse circumstances, including involuntary underemployment and varying household

incomes, with those experiencing pandemic-related income losses being more likely to perceive financial strain (Hanno et al., 2022; Vesely et al., 2022). Unfortunately, the lack of collected income data limited the scope of the study. Conversely, the decrease in economic threat during Phase 5 confirms both *H2a* and *H2b*, as economic threats diminished during periods of low COVID-19 activity and were similarly perceived among participants.

From a practical perspective, findings underscore that preschool teachers experienced economic threats as financial strain. Addressing this issue in future crises requires adequate professional compensation and governmental support for ECEC centers, rather than placing the burden solely on individual teachers or institutional resources. Implementing hazard bonuses and providing grants to support staffing needs can alleviate some of the financial strains on teachers and institutions, preventing burnout and staff turnover (Al-Adwan & Al-Khayat, 2017; Whitebook & Sakai, 2003).

Preschool teachers perceived Phase 3 and Phase 6 as the most threatening, potentially due to preceding summer plateaus characterized by reduced measures and low incidences (Tolksdorf et al., 2022). Sudden autumn incidence rises, coupled with concerns about winter intensification, likely heightened threat perceptions in these phases. These results align with previous research suggesting low incidence phases can create a false sense of certainty, making subsequent surges more impactful (Mangot-Sala et al., 2023). pandemic phases. Some preschool teachers may have experienced heightened infection threat due to personal health vulnerabilities, while others felt more threatened by economic factors (Vesely et al., 2022). This aligns with the Stress and Coping Theory, which suggests that individuals' responses to stressors (or threats) are influenced by their perceived control and available resources (Lazarus & Folkman, 1984).

### 5.2. Stability and change in affective well-being and COVID-19-related mental strain

Research Question 2 aimed to elucidate changes in preschool teachers' affective well-being and COVID-19-related mental strain during the 18-month study period. Phases 3 and 6 showed decreases in positive affect and increases in negative affect, while Phase 5 reflected improved well-being due to lower incidences, supporting *H3a.* These fluctuations in affective well-being among preschool teachers were closely linked to the dynamics of COVID-19 events, mirroring patterns of depression, anxiety, and negative affect observed in other studies (Foa et al., 2022; Mangot-Sala et al., 2023).

Similarly, COVID-19 related mental strain increased Phases 3 and 6, with consistent change rates between participants, supporting *H4a* and *H4b*. Previous research has indicated that substantial changes in daily routines due to governmental infection prevention measures often led to heightened emotional exhaustion and psychological strain among preschool teachers, caused by increased workloads and new responsibilities. This observed increase in mental strain during specific phases can be attributed to repeated lockdown extensions and the need to adapt to new hygiene and social distancing rules (Kuger et al., 2022). Overall, results align with previous research highlighting the significant impact of the COVID-19 pandemic on psychological well-being (Kwon et al., 2022; Swigonski et al., 2021). Notably, the consistent change rates suggest a uniform vulnerability among preschool teachers, emphasizing the need to prioritize their well-being in high-stress situations. This requires equitable support, adequate resources, and improved working conditions.

### 5.3. COVID-19-related threats and affective well-being

To test *H5*, we examined the between- and within-person associations between COVID-19 infection threat and affective well-being (see Table 4). Our findings consistently revealed a negative relationship between preschool teachers' perceived infection threat and their affective well-being, at both levels. This aligns with prior pandemic-related research, which found that higher infection threat correlates with lower positive affect and increased negative affect (Han et al., 2021; Prati et al., 2011). To enhance preschool teachers' well-being and ensure high-quality instructional practices in German ECEC settings, targeted interventions aimed at reducing infection threat are crucial (Rusby et al., 2013).

Another significant finding pertains to the relationship between economic threat and affective well-being, which, though weaker than the influence of infection threat in our study, still supports H5. In contrast, (Han et al., 2021) reported a stronger association between economic threat and well-being. This discrepancy may be explained by the unique context in Germany, where distance learning was not implemented in early childhood education, and preschool staff maintained close contact with children (Neuberger et al., 2023). This likely heightened the perceived infection threat, making it a more significant factor for preschool teachers in our study compared to other research contexts. Furthermore, the high level of job-related strain and constant interaction with young children may have amplified the perceived impact of infection threats over economic concerns.

### 5.4. COVID-19-related threats and mental strain

To further test *H5*, we examined both, the between- and within-person associations between COVID-19 infection threat and mental strain. Higher average levels of COVID-19 infection threat were consistently linked to increased mental strain among preschool teachers, particularly at measurement points where the perceived infection threat exceeded their usual levels. To support preschool teachers' mental health and help them cope with stress and new demands, providing mental health consultations, counseling, and fostering transparent communication, along with granting employees participatory rights, is essential beyond the scope of a pandemic (Ray, 2007).

In terms of the relationship between COVID-19-related economic threat and mental strain, our results indicate that higher average economic threat correlates with increased mental strain. Similarly, mental strain was increased on measurement points when participants reported higher-than-usual levels of economic threat. These findings support the idea that economic threat contributed to declining mental health during the pandemic. Given the variability in perceptions of economic threat, future research should focus on understanding reasons for interindividual differences and identify risk factors such as socio-economic status, income or involuntary underemployment (Lu & Lin, 2021).

Among the covariates, only neuroticism emerged as significant in most models, highlighting the importance of controlling for this character trait when analyzing affective well-being. This result aligns with theoretical expectations, as individuals high in neuroticism typically express more negative emotions, exhibit greater emotional instability, and experience heightened stress reactions (Diener et al., 2003).

### 5.5. Moderating effects of emotion regulation strategies

Addressing Research Question 3, we investigated how participants' ER strategies influenced the relationships of COVID-19 related threats and affective well-being, mental strain, respectively. Cognitive reappraisal significantly moderated the negative between-person association of COVID-19 infection threat and positive affect, as well as the within-person relationship between economic threat and mental strain, supporting *H5a*. These findings suggest that cognitive reappraisal can buffer the negative effects of both infection and economic threats (Table 4).

Expressive suppression notably intensified the negative association between infection threat and positive affect at the between-person level, supporting *H5b*. Interestingly, at the between-person level, higher average suppression was linked to lower mental strain from economic threat, whereas at the within-person level, heightened economic threat, combined with a higher average use of suppression, resulted in

increased mental strain. This indicates that while expressive suppression may mitigate perceived economic threat up to a point, it becomes less effective once threat levels surpass typical thresholds.

These nuanced findings highlight the need to explore additional coping mechanisms. Overall, our results align with previous research findings, emphasizing the greater effectiveness of cognitive reappraisal over suppression in managing emotional responses (Jeon & Ardeleanu, 2020; San Too & Butterworth, 2018). Providing emotion regulation training for preschool teachers could be a valuable intervention for addressing both pandemic-related threats and occupational challenges.

### 5.6. Limitations and future directions

While this study provided valuable insights into the COVID-19 pandemic's impact on preschool teachers, it has certain limitations. First, the significant amount of missing data, likely stemming from the lengthy 18-month survey and the sensitivity of the topic, posed challenges. Continuous recruitment helped maintain sample size, but the intensive longitudinal design resulted in missing data from early dropouts and late entrants, a common issue in longitudinal research. However, based on simulation studies (e.g., Maas & Hox, 2005), we believe our level-2 sample size, along with pairwise deletion and restricted maximum likelihood estimation, sufficiently mitigated potential bias. To enhance future studies, increased transparency, such as feedback on results, could boost participant motivation, while strategies like reminders or incentives might improve participation rates.

We aimed to capture the evolving well-being of preschool teachers without imposing undue burden, allowing ongoing recruitment and non-response/dropout without consequences. We used statistical analyses that are robust to robust to the present pattern of missing data, affirming the advantages of our study design despite low compliance rates.

Furthermore, the study lacked standardized and validated scales for some constructs, emphasizing the need for suitable measurement instruments tailored to preschool teachers and longitudinal research. Future studies should consider incorporating passive, non-invasive, objective measures alongside subjective ratings for a more comprehensive understanding of individual experiences. Tools such as heart rate variability or cortisol levels could provide valuable insights into the links between stressors and stress reactions.

Finally, we focused on a limited number of covariates to reduce participant burden, which restricted the scope of our research. Variations in working conditions (e.g. staffing ratios, income), societal conditions, and available resources vary across participants and may influence the examined constructs. Addressing these variables in future research is crucial for a nuanced understanding of preschool teachers' well-being and for exploring differences in change rates.

## 6. Implications and conclusion

Our study clearly demonstrates that the COVID-19 pandemic significantly impacted preschool teachers in Germany. Utilizing a longitudinal design over 18 months, this research provides a unique and more comprehensive perspective than most studies, which typically cover only a few months. This extensive study period allowed for multilevel analyses, revealing that while perceptions of COVID-related threats changed similarly among teachers during certain phases, there were notable differences in the rates of change during others.

These unique insights highlight the need for future research to incorporate additional covariates at both the individual (e.g., income, degree of employment) and institutional levels (e.g., size of the institution, type of COVID-19 measures). Such variables can help clarify the underlying factors shaping differing threat perceptions, ultimately leading to more targeted and effective interventions.

In addition to these findings, our results also reveal critical vulnerabilities within Germany's ECEC system, particularly in times of crisis like the pandemic. The significant impact on teachers' well-being and mental health underscores the urgent need for robust support structures. However systemic reforms are often difficult to implement due to bureaucratic processes, even though staffing shortages and other structural issues have long been known (Klusemann et al., 2020). In pandemic situations, it is essential to ensure adequate staffing and include non-educational personnel to manage infection risks. Staffing shortages in preschools have hindered the implementation of essential hygiene measures and intensified emotional strain among teachers (Kuger et al., 2022). Utilizing non-educational staff, who require fewer qualifications, can alleviate these challenges, allowing pedagogical staff to focus on their core responsibilities.

In the short term, strategies to enhance emotional resilience, such as cognitive reappraisal and expressive suppression, could significantly reduce mental strain and strengthen overall well-being among preschool teachers. Implementing mindfulness-based interventions could also be beneficial, providing teachers with practical tools to manage stress and fostering a healthier emotional climate in early childhood education settings (Roeser et al., 2013). These approaches can serve as immediate relief for teachers facing heightened stress due to the pandemic. Looking toward long-term solutions, systemic reforms are crucial. One possible step is addressing the chronic personnel shortage by elevating the professional and financial recognition of preschool teachers.

A possible step in addressing the personnel shortage and enhancing the professional and financial recognition of preschool teachers is to improve their academic training and equalize their status with primary school educators. This approach could not only help alleviate the staffing shortage but also provide long-overdue recognition of their essential role.

In summary, our findings offer valuable insights into the specific challenges faced by preschool teachers during the pandemic and provide concrete recommendations for both immediate interventions and long-term reforms to better support them in future crises.

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## Publication ethics

Informed consent was obtained from all participants included in the study and the data protection guidelines of DSGVO were followed. All procedures in studies involving human participants were performed in accordance with the ethical standards approved by the ethical committee of the University of Tuebingen (AZ: Gawrilow_2020_0903_203).

## CRediT authorship contribution statement

**Julia Steigleder:** Writing – original draft, Visualization, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **Lilly Buhr:** Writing – review & editing, Project administration, Investigation, Formal analysis, Data curation. **Jan-Henning Ehm:** Writing – review & editing, Supervision, Conceptualization. **Caterina Gawrilow:** Writing – review & editing, Supervision, Funding acquisition, Conceptualization. **Antje von Suchodoletz:** Writing – review & editing, Supervision, Conceptualization.

## Declarations of competing interest

None.

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## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.ecresq.2024.11.001.

## Data availability

Data will be made available on request.

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# Appendix D: Manuscript 3

**Steigleder, J.,** Gawrilow, C., & von Suchodoletz, A. (2024). *Alltagsbewältigung in der Krise: Auswirkungen der COVID-19-Pandemie auf die Arbeit von Kitaleitungen. Qualitative Studie* [Coping with everyday life in times of crisis: Effects of the COVID-19 pandemic on ECEC leaders. A qualitative Study]. Department of Psychology, University of Tübingen. [Unpublished manuscript]

# Alltagsbewältigung in der Krise: Auswirkungen der COVID-19-Pandemie auf die Arbeit von Kitaleitungen


## German Abstract

Während der COVID-19-Pandemie stellten Schließungen, der eingeschränkte Regelbetrieb und Corona-Kita-Verordnungen neue Herausforderungen für Kindertageseinrichtungen dar. Vor allem bei der Organisation und Aufrechterhaltung des pädagogischen Betriebs nahmen die Kitaleitungen eine zentrale Rolle ein. In dieser Studie wurden die Auswirkungen der COVID-19-Pandemie auf die Arbeit von Kitaleitungen untersucht. Anhand von Interviews (n = 35) wurde die Wahrnehmung auf institutioneller Ebene, interaktionaler Ebene und Leitungsebene betrachtet. Die Ergebnisse verdeutlichen die komplexen Anforderungen an Kitaleitungen und bieten die Chance, das Aufgabengebiet von Kitaleitungen hinsichtlich des Krisenmanagements zu überdenken und verbesserte Rahmenbedingungen zu schaffen.



## Schlüsselwörter

COVID-19 Pandemie, Kitaleitung, Qualitative Studie, Kindertageseinrichtungen



## Abstract

During the COVID-19 pandemic, closures, restricted regular opening, and regulations posed new challenges for daycare centers. Daycare center directors played a central role in organizing and maintaining daycare. This study examined the impact of the COVID-19 pandemic on daycare center directors. Qualitative interviews (n = 35) were used to examine perceptions at institutional, interactional and leadership level. Findings underscore the multifaceted demands, prompting a reevaluation of their roles in crisis management and the pursuit of enhanced working conditions.



## Keywords

COVID-19 pandemic, daycare center directors, qualitative study, preschools

## Alltagsbewältigung in Zeiten der Krise

Die Bedeutung von Kindertageseinrichtungen (Kitas) als Bildungseinrichtungen junger Kinder und als notwendige Ressource für berufstätige Eltern hat in den letzten Jahrzehnten zugenommen (Knauf, 2020). Im Zuge der COVID-19-Pandemie wurde ihre zentrale Rolle besonders sichtbar, da zuverlässige Betreuungsmöglichkeiten für Eltern kleiner Kinder, insbesondere aber für Eltern in systemrelevanten Berufen, unabdingbar wurden. Die gesteigerte Relevanz brachte Erwartungen seitens der Politik und Gesellschaft mit sich, für deren Umsetzung vor allem Kitaleitungen in der Verantwortung standen.

Die COVID-19-Pandemie, als umweltbezogene Krise, traf auf die systembezogene Krise des Systems der Frühkindlichen Betreuung, Bildung und Erziehung (FBBE) und schuf eine Ausnahmesituation für alle Beschäftigten. Bereits vor dem Ausbruch der Pandemie lag der Tätigkeitsfokus der Kitaleitungen auf dem Personalmanagement, da der anhaltende Fachkräftemangel ein Hindernis für die Gewährleistung eines reibungslosen pädagogischen Betriebs darstellte (Autorengruppe Fachkräftebarometer, 2019). Um die Betreuungsmöglichkeiten während der Pandemie aufrechtzuerhalten, sahen sich die Kitaleitungen mit der Herausforderung konfrontiert, das Krisenmanagement in den Kita-Alltag zu integrieren, ohne jedoch auf etablierte Handlungsmuster zurückgreifen zu können und ohne klare Hinweise zur Umsetzung der vorgeschriebenen Maßnahmen.

Diese Situation veränderte nicht nur Aufgabenfelder der Kitaleitungen sowie die sozialen Beziehungen innerhalb der Einrichtungen, sondern erforderte auch eine sorgfältige Berücksichtigung der Bedürfnisse aller Beteiligten. Kitaleitungen übernahmen die Schlüsselrolle im Krisenmanagement, um die an die Kitas gestellten Erwartungen unter den spezifischen gesellschaftspolitischen Bedingungen zu erfüllen. Vor diesem Hintergrund wird in der hier vorgestellten qualitativen Studie genauer beleuchtet, wie sich die COVID-19-Pandemie auf verschiedenen Ebenen auf die Arbeit der Kitaleitungen ausgewirkt hat.

### *Kitaleitung: Eine umfangreiche und vielfältige Rolle*

Im deutschen FBBE-System nehmen Kitaleitungen eine Schlüsselposition ein; sie sind verantwortlich für die pädagogische Leitung, das Personalmanagement und die Verwaltung von Kitas (Rodd, 2020). Sie fungieren dabei als essenzielles Bindeglied zwischen Eltern, pädagogischen Fachkräften und dem Träger. Die gestiegene gesellschaftliche Bedeutung von Kitas

hat nicht nur den Stellenwert der Kitaleitung verändert, sondern auch das Aufgabenfeld und die Anforderungen auf verschiedenen Ebenen vielschichtiger und komplexer gemacht.

Das Modell von Strehmel and Ulber (2020) strukturiert die umfassenden und miteinander verflochtenen Aufgabenbereiche der Kitaleitung in sieben Dimensionen. Auf institutioneller Ebene liegt der Fokus auf der Beobachtung von Rahmenbedingungen und Trends sowie der kontinuierlichen Weiterentwicklung der Organisation. Auf der interaktionalen Ebene gestaltet die Kitaleitung die Zusammenarbeit im Team und führt durch effektives Personalmanagement die Mitarbeiter*innen. Die Leitungsebene umfasst Kernaufgaben, Selbstmanagement und die Entwicklung eines strategischen Rahmens für die Kita als Institution. Das Modell verdeutlicht, dass ein wesentliches Merkmal der Tätigkeit von Kitaleitungen im deutschen FBBE-System die Vielfalt der ihnen zugewiesenen Aufgaben und Rollen ist.

### *COVID-19 Pandemie*

Während der Pandemie wurde die Betreuungssituation in Kitas zum Fokus gesellschaftlicher Aufmerksamkeit, wobei die Situation der im FBBE-System tätigen Beschäftigten oft vernachlässigt wurde (Der Paritätische Gesamtverband, 2023). Entscheidungen verschiedener Interessensgruppen und der Politik bezüglich der Pandemiebewältigung prägten maßgeblich die Arbeitsbedingungen für und in Kitas und brachten hohe Erwartungen an Kitaleitungen mit sich. Diese Dynamik beeinflusste das Aufgabenfeld der Kitaleitungen auf verschiedenen Ebenen, da die COVID-19-Pandemie ein umfassendes Krisenmanagement erforderte.

Auf institutioneller Ebene wirkte sich die Pandemie durch Kita-Schließungen, Phasen der Notbetreuung und eingeschränkten Regelbetrieb aus, wodurch Kitaleitungen schnell auf die Umsetzung von Corona-Kita-Verordnungen reagieren mussten, insbesondere bei der Sicherstellung der Hygienemaßnahmen. Auf der interaktionalen Ebene waren Kitas gezwungen, Kontaktbeschränkungen innerhalb der Einrichtungen und zu den Familien zu berücksichtigen und auf digitale Kommunikationsmittel zurückzugreifen. Dabei mussten Kitaleitungen effektive Kommunikationsstrukturen etablieren und zwischen den verschiedenen Beteiligten und ihren unterschiedlichen Erwartungen vermitteln (Strehmel et al., 2023). Auch auf Leitungsebene zeigten sich Auswirkungen, wie administrativer Mehraufwand oder Belastungserleben, da die

Kitaleitungen trotz bestehender Einschränkungen die pädagogische Qualität umsetzen und sicherstellen mussten (Kuger et al., 2022).

## Methode und Design

Dieser Beitrag untersucht, wie Kitaleitungen die tätigkeitsbezogenen Auswirkungen der COVID-19-Pandemie wahrgenommen haben. In Anlehnung an das Modell von Strehmel and Ulber (2020) wurden die Auswirkungen auf den Arbeitsalltag von Kitaleitungen auf drei Ebenen betrachtet: Institutionelle Ebene, Interaktionale Ebene und Leistungsebene. Die subjektiven Wahrnehmungen wurden durch leitfadengestützte, halbstrukturierte Interviews erfasst und gemäß dem konzeptionellen Rahmen der Grounded Theory analysiert (Corbin & Strauss, 2014). Somit konnten die Erfahrungen der Befragten erfasst und miteinander vergleichbar gemacht werden.

### *Stichprobe*

In dieser Studie wurden Kitaleitungen rekrutiert, die nach oder während der Fortbildungsphase an Veranstaltungen der Stiftung "Kinder forschen" teilgenommen hatten. Die Rekrutierung beschränkte sich auf die Bundesländer, in denen die laufende Fortbildung der Stiftung angeboten wurde: Sachsen, Hamburg, Baden-Württemberg und Nordrhein-Westfalen. Es wurde gewährleistet, dass die Kitaleitungen in Einrichtungen vergleichbarer Größe tätig waren. Durch das Ethikvotum der Universität Tübingen wurden die Einhaltung der ethischen Richtlinien für die Datenerhebung und -analyse sichergestellt.

Im Zeitraum von Dezember 2020 bis Juni 2021 wurden insgesamt 35 Interviews durchgeführt. Die Kitaleitungen waren im Durchschnitt 45.17 Jahre alt ($SD$ = 9.3), 94 % waren weiblich. Die Teilnehmer*innen arbeiteten in Einrichtungen mit durchschnittlich 77 Kindern ($SD$ = 23.93), die von mehreren pädagogischen Fachkräften betreut wurden ($M$ = 14.82, $SD$ = 5.94). Die allgemeine Arbeitserfahrung im FBBE-Bereich variierte zwischen 10 und 37 Jahren ($M$ = 22.84, $SD$ = 8.06); die Leitungserfahrung lag zwischen 2 und 23 Jahren ($M$ = 10.06 Jahre, $SD$ = 7.63).

### *Datenerhebung und -analyse*

Qualitative, leitfadengestützte Interviews wurden genutzt, um die Wahrnehmungen und Erfahrungen der Kitaleitungen bezüglich der tätigkeitsbezogenen Auswirkungen der COVID-19-Pandemie zu erfassen. Die Interviews waren Teil einer Evaluationsstudie der Stiftung „Kinder forschen“, daher wurden lediglich Fragen mit Bezug auf die COVID-19-Pandemie ausgewertet

(siehe ESM1, IV). Der Fokus dieser Fragen lag auf (1) den Auswirkungen der COVID-19-Pandemie auf die Arbeit der Kitaleitungen sowie (2) kurz- und langfristigen Veränderungen in der Rolle als Kitaleitung. Die Interviews wurden telefonisch durchgeführt und dauerten zwischen 60 und 105 Minuten.

**Ergebnisse**

Im iterativen Prozess des offenen und axialen Kodierens wurden vier Hauptkategorien identifiziert: Auswirkungen auf institutioneller Ebene (1), auf interaktionaler Ebene (2), auf Leitungsebene (3) sowie positive Auswirkungen (4). Das detaillierte Kodierschema mit Haupt- und Unterkategorien wird im Folgenden beschrieben und ist ebenfalls in ESM 2 dargestellt.

*Auswirkungen auf institutioneller Ebene*

Insgesamt berichteten 91.43 % (*n* = 32) der befragten Kitaleitungen von Auswirkungen der COVID-19-Pandemie auf institutioneller Ebene (Kategorie 1), unterteilt in fünf Subkategorien. Bezüglich der Umsetzung der Corona-Verordnungen berichteten 28.57 % (*n* = 9) der Befragten, wenig Zeit für die Planung der Umsetzung der Maßnahmen zu haben, da die Ministerien neue Verordnungen oft kurzfristig bekannt gaben. Eine Teilnehmer*in drückte dies so aus: *„… viele Informationen von der Regierung kamen halt oft am Freitag oder Samstag und man musste das über das Wochenende erledigen“* (L1). Insbesondere die Dokumente der Ministerien wurden als unklar und unpraktikabel empfunden: „…, *wenn man meint, man hat ein sehr detailreiches Papier vom Ministerium, wie wir uns verhalten können, […] das ist alles so dehnbar gewesen“* (L2). Schon zu Beginn der Pandemie zeigte die DKLK-Studie (2021), dass 80% der Kitaleitungen die fortlaufend wechselnden und/oder unklaren Vorgaben als problematisch empfanden, da sie zu mangelnder Planungssicherheit führten.

Eine zusätzliche Auswirkung, die von 40 % (*n* = 14) der Kitaleitungen benannt wurde, war die Umsetzung von Hygiene- und Schutzmaßnahmen, einschließlich dem Durchführen von Testungen. Dabei verdeutlichten die Kitaleitungen den erheblichen Aufwand, der durch die Hygienekonzepte für die Einrichtungen entstand: *„…das heißt, sie sind dauernd am Lüften, sie sind dauernd am Gucken, wir begleiten die Kinder auf Toilette, die Toilette wird halt gesäubert, wenn das Kind darauf war. Und zwar bei jedem Kind…“* (L3). Die Befragten unterstrichen, dass es für die Einrichtungen eine Herausforderung darstellte, Eltern im Rahmen der Hygienemaßnahmen nicht in die Einrichtungen zu lassen: *„wir nehmen die Kinder von draußen*

*rein, also die wir lassen die Eltern nicht in die Einrichtung […], wenn sie nicht getestet sind oder nicht geimpft sind und das alleine ist 'ne Herausforderung"* (L4).

Die Kontaktreduzierung durch Gruppentrennung wurde von 25.71 % (*n* = 9) der Kitaleitungen als weitere Auswirkung benannt. Dabei betonten die Kitaleitungen wiederholt, dass dies die Zusammenarbeit im Team erheblich beeinträchtigte und zu einer deutlichen Zunahme der Isolierung der Gruppen führte: „…*wir arbeiten von Anfang an in getrennten Gruppenstrukturen vom ersten Tag an und nicht nur die Kinder, sondern auch die Kolleginnen*." (L10).

Während der COVID-19-Pandemie beschrieben 45.71% (*n* = 16) der Kitaleitungen ihren Arbeitsalltag als von ständigen Veränderungen geprägt: *„ …was sich für mich noch verändert hat, ist dieses (fahren auf Sicht nenne ich es mal?), also dass wir einfach nicht so langfristig planen können und sondern eher flexibel agieren müssen…"* (L5). Die Wahrnehmungen der Leitungen verdeutlichen, dass in den Einrichtungen eine erhebliche Planungsunsicherheit herrschte. Dies erforderte von den Kitaleitungen eine erhöhte Flexibilität, die jedoch nicht von allen geleistet werden konnte. Diese Planungsunsicherheit und ständigen Veränderungen im pädagogischen Handeln wurden in den Beschreibungen der Leitungen auch auf politische Entscheidungen zurückgeführt, insbesondere auf die Corona-Kita-Verordnungen: *„… also das ist wirklich so das erste Entscheidungskriterium im Moment. Egal, um was für ein Thema es geht, ist immer Corona erstmal Nummer eins, um zu gucken, was darf ich, was darf ich nicht, was muss ich beachten."* (L6).

In der letzten Subkategorie auf institutioneller Ebene beschrieben 25.71% (*n* = 9) der Kitaleitungen Abweichungen bei der Umsetzung genereller Leitungsaufgaben und im pädagogischen Alltag. Besonders betonten die Befragten, dass sich die pädagogischen Konzepte der Einrichtungen grundlegend geändert haben bzw. ändern mussten. Die Leitungen beschrieben zudem, dass unter den Bedingungen der COVID-19-Pandemie eine Weiterentwicklung ihrer Einrichtung nicht möglich war: „…*wir sind auch ausgebremst definitiv, was die Weiterentwicklung gerade anbelangt, weil vieles gerade keinen Sinn macht, weil wir nicht wissen - können wir es umsetzen, wann können wir es umsetzen."* (L7).

***Auswirkungen auf interaktionaler Ebene***

Auf der interaktionalen Ebene (Kategorie 2) beschrieben 60% (*n* = 21) der Kitaleitungen Auswirkungen, die sich in zwei Subkategorien unterteilten. Von 31.43 % (*n* = 11) der Kitaleitungen

wurden Auswirkungen in den Interaktionen mit Familien und Eltern wahrgenommen. Dabei berichteten die Befragten über auftretende Konflikte und ein mangelndes Verständnis der Eltern hinsichtlich der geltenden Hygiene- und Schutzmaßnahmen: *„Also ich habe selten so ein schwieriges Verhältnis zu der Elternschaft gehabt, man muss Eltern ermahnen, erinnern, "Bitte tragen Sie die Maske!" "* (L8). Deutlich wurde ebenfalls, dass aufgrund der begrenzten Möglichkeiten für Gesprächs- und Begegnungssituationen häufig kein direkter Kontakt zu den Eltern und Familien hergestellt werden konnte.

In Bezug auf die Teaminteraktion gaben 54.29% ($n$ = 19) der Kitaleitungen an, dass bisherige Möglichkeiten für den persönlichen Kontakt und Austausch nicht mehr genutzt werden konnten und durch digitale Kommunikationsmittel ersetzt werden mussten. Dies beeinträchtigte laut den Befragten auch den zwischenmenschlichen Kontakt im Team: *„Also ich habe den Kontakt zum Team verloren, einfach auch weil wir uns voneinander fernhalten sollten."* (L8). Die Umsetzung von (Hygiene-)Maßnahmen führte laut den Befragten zu Konflikten, die sich auf die Teamarbeit auswirkten. Zusätzlich lösten die Umstände der COVID-19 Pandemie aus Sicht der Leitungen Ansteckungsängste und Sorgen aus, was eine emotionale Belastung für ihre Mitarbeitenden darstellte: *„Die Kollegen haben Angst vor Covid-19, das einfach zu kriegen, jeder hat Angehörige, hat Oma, Opa oder Schwiegereltern und hat Angst, das da reinzutragen aus dem Kindergarten raus oder andersrum […] wir sind müde, muss ich einfach sagen."* (L3). Dies fand auch Bestätigung in den Ergebnissen von Strehmel (2023), die darauf hinwiesen, dass das Auffangen von Ängsten und die Aufrechterhaltung der Kommunikation die Teamführung nachteilig beeinträchtigen können.

***Auswirkungen auf Leitungsebene***

Auf Leitungsebene (Kategorie 3) berichteten 91.43% ($n$ = 32) von Auswirkungen, die sich in fünf unterschiedliche Subkategorien gliederten. Von den Befragten gaben 88.57% ($n$ = 31) an, dass die wachsenden bürokratischen und organisatorischen Anforderungen zu einem gesteigerten Zeit- und Arbeitsaufwand führten: *„… das bedeutet für mich natürlich, dass ich viel mehr koordinieren und planen muss […] ich sag mal meine normale Arbeit, die ich sonst tun müsste, wird davon ja nicht weniger, also die mache ich halt zusätzlich."* (L10). Bereits Oeltjendiers et al. (2021) verwiesen auf Basis empirischer Analysen auf den gestiegenen Zeitaufwand für Leitungstätigkeiten während der Pandemie, insbesondere für Organisations- und Betriebs- und Mitarbeiterführung, sowie Digitalisierung. Für die Kitaleitungen umfasste das die Sicherstellung

und Anwendung der in der Regel neu eingeführten digitalen Kommunikationsmittel sowie eine vorausschauendere Planung und erhöhte Flexibilität in der Entscheidungsfindung. Die Aussagen der Kitaleitungen verwiesen auf spezifische Faktoren zur Erklärung des erhöhten bürokratischen und organisatorischen Aufwandes. Zum einen führte die Umsetzung und Kommunikation der Corona-Kita-Verordnungen zu einem gesteigerten Arbeitsaufwand: *„… die ich dann in einer sehr kurzen Zeit erstmal publik machen muss […] dadurch entsteht natürlich ein unglaubliches Arbeitspensum, zeitlich.“* (L10). Ebenso beeinflusste die Organisation und Verwaltung der Notbetreuung gemäß den Verordnungen ihr Arbeitspensum: *„…die Herausforderungen finde ich als Kitaleitung ist schon so, dass es sich verwaltungstechnisch maßgeblich gesteigert hat, also die ganzen Abrechnungsgeschichten von Notbetreuungen und einzelnen Tagen jetzt bei uns ist sehr immens geworden.“* (L11). In diesen Phasen der Notbetreuung mussten Mitarbeiter mit Aufgaben versorgt werden, wie eine Leitung formulierte: *„… wenn wir ins Home-Office gehen, dann irgendwelche Sachen ausarbeiten oder erarbeiten müssen, ich muss dann halt schon für meine Mitarbeiter, ich sag mal so Hausaufgabenpakete schnüren.“* (L9). Auch die Umsetzung von Hygienemaßnahmen, einschließlich der Beschaffung von Hygienematerialien und der Organisation von Testverfahren, wurde von den Kitaleitungen als zeitaufwändig und arbeitsintensiv wahrgenommen: *„…zu gucken, welches Kind war es mit dieser Teststrategie, die verwaltungstechnische Geschichte, dass jedes Kind auch die Tests dann hat, die dann gestellt werden, dass die Eltern dann auch diesen Nachweis dann bringen, also diese Geschichten zu koordinieren […] das sind schon die großen Herausforderungen“* (L11). Die Leitungen beschrieben die Etablierung neuer Strukturen sowie die zusätzliche Personal- und Raumplanung aufgrund der Gruppentrennung als weitere Faktoren, die den gestiegenen bürokratischen und organisatorischen Aufwand bedingten.

Die Aussagen der Leitungen lassen sich in eine weitere Subkategorie einordnen, so beschrieben 17.14% ($n$ = 6) der Befragten eine deutliche Überschreitung der täglichen Arbeitszeit aufgrund von Wochenendarbeit und der Notwendigkeit der ständigen Erreichbarkeit: *„… ich hab echt am Wochenende zuhause gesessen Samstags gearbeitet, sonntags gearbeitet um da einen Plan aufzustellen und ich fands einfach nur schrecklich“* (L2). Hinweise auf mögliche psychische Belastungen, Ängste und Sorgen der Kitaleitungen aufgrund der COVID-19-Pandemie ergaben sich aus den Beschreibungen der Arbeitsbedingungen, wie in dieser Aussage: *„…entsteht natürlich ein unglaubliches Arbeitspensum, zeitlich, vom Druck auch oft geprägt und das hat natürlich Einfluss auf die gesamte Arbeit, ist schon anstrengender und belastender geworden.“* (L10). Die

Leitungen verwiesen meist auf Konflikte mit Eltern oder Mitarbeitern aufgrund der Hygiene- und Schutzmaßnahmen als weitere Ursache für die psychischen Belastungen: *„…die Eltern sind auch mir gegenüber oft nicht mehr fachlich geblieben, es war mir wirklich ne sehr starke Belastung für die Nerven muss ich ganz ehrlich zugeben* (L12).

In den Aussagen von 48.57% (*n* = 17) der befragten Leitungen wurde ein erhöhtes Maß an Verantwortung und Fürsorge deutlich. Sie beschrieben, dass sie Ängste und Sorgen innerhalb des Teams auffangen und Entscheidungen im Sinne aller Beteiligten treffen mussten: *„… unter anderem eine Sicherheitsbeauftragte, ich bin eine Hygienebeauftragte und ich bin gleichzeitig die Person, die es vorgibt und die auch die Aufsicht hat, ja? Für Eltern, für Kinder und für das Team.“* (L10). Gemäß den Schilderungen der Leitungen fühlten sie sich auch dazu verpflichtet, in der Zusammenarbeit mit den Familien Ängste und Sorgen der Eltern aufzufangen und beratend tätig zu werden. Zudem spielten sie eine maßgebliche Rolle bei der Aufrechterhaltung des Teamklimas, der Motivation der Mitarbeiter und der Vermittlung von Sicherheit: *„…mit den Ängsten umzugehen, die Kollegen haben und das musste ich auch lernen in dieser Position als Leitung, wie gehe ich damit um, wenn eine Kollegin hier steht und sagt: "Mir ist das alles zu viel," und wie kann man dann halt agieren und was kann man machen und welche Lösungen findet man und ja, da gab es viele viele Veränderungen und viele herausfordernde Situationen.“* (L13). Die erhöhte Verantwortungsübernahme wird auch in den quantitativen Ergebnissen von Oeltjendiers et al. (2021) beschrieben, die sie als einen Faktor für die Arbeitsbelastung der Leitungen identifizierten.

Gemäß den Schilderungen erlebten 17.14% (*n* = 6) Befragten einen mentalen Spannungszustand, da sie während der COVID-19-Pandemie häufig Entscheidungen treffen oder vermitteln mussten, die im Widerspruch zu ihren beruflichen Werten und Bestimmungen standen: *„…das ist die größte Herausforderung im Moment von der Psyche, das aushalten zu können, das die Politiker Entscheidungen treffen, die man vielleicht persönlich nicht treffen würde und dann immer die Differenzierung: wie denke ich als Leitung, wie denke ich als Privatperson über die Situation …“* (L2).

***Positive Auswirkungen der COVID-19 Pandemie***

Zusätzlich zu den überwiegend negativen Auswirkungen beschreiben 22.86% (*n* = 8) der Befragten aber auch positive Auswirkungen während der COVID-19-Pandemie (Kategorie 4):

- Fortschritte in der Digitalisierung: *„…, dass man neue Wege finden musste und ja, sich mit dieser digitalen Technik noch mehr vertraut machen musste. Das ist aber auch wieder etwas Positives. Ich glaube, wir - gerade auch der Träger – wäre für so viel Digitalisierung vorher nicht offen gewesen“* (L6).

- Zeitersparnis durch digitale Termine: *„…, dass Termine eben alle virtuell stattfinden, sodass man nicht von einem Ort in den anderen fahren muss und dadurch viel Zeitersparnis hat.“* (L14).

- Mehr Zeit für die Familie: *„…ehrlicherweise ganz - ganz positiv ausgewirkt, ich hab viel Familienzeit gekriegt dadurch“* (L5).

- Konzentriertes Arbeiten im Homeoffice: *„Also ich hab jetzt während Corona sehr viel im Home-Office gearbeitet, da konnte ich viel und gut weg arbeiten.“* (L15).

**Diskussion und Fazit**

Die COVID-19-Pandemie hat den beruflichen Alltag der Kitaleitungen in vielfältiger Weise auf verschiedenen Ebenen beeinflusst. Auf institutioneller Ebene waren sie mit Planungsunsicherheit und unklaren staatlichen Vorgaben konfrontiert. Auch die DKLK-Studie (2021) unterstreicht die Notwendigkeit klarer, einheitlicher staatlicher Vorgaben. Zusätzliche Fortbildungsangebote könnten die Flexibilität und Handlungskompetenz der Kitaleitungen für kommende Krisen stärken. Die Implementierung der Hygienemaßnahmen, insbesondere die Organisation des Testgeschehens, wurde als konkrete Auswirkung auf den Arbeitsalltag wahrgenommen. Eine konkrete Entlastung könnte durch die Integration von nicht-pädagogischem Personal erfolgen, um Kitaleitungen und pädagogische Fachkräfte bei der Umsetzung der Hygienemaßnahmen zu unterstützen.

Auf der interaktionalen Ebene wurde die eingeschränkte Zusammenarbeit mit Familien als Auswirkung der COVID-19-Pandemie beschrieben. Besonders das Unverständnis der Eltern und resultierende Konflikte hinsichtlich der Schutzmaßnahmen konnten nur selten im direkten Kontakt geklärt werden. Eine stärkere Vereinheitlichung der Maßnahmen in zukünftigen Krisenverordnungen könnte potenziell Diskussionen und Unverständnis in kommenden Krisen vorbeugen.

Effiziente digitale Kommunikationssysteme könnten die nachhaltige Entwicklung eines widerstandsfähigen FBBE-Systems unterstützen und als wertvolle Ressource für Team- und Netzwerkarbeit dienen. Obwohl die Befragten die Digitalisierungsfortschritte positiv beurteilten, unterstreicht die DKLK-Studie (2021) den Bedarf an einer verbesserten digitalen Ausstattung von Kitas. Die Übertragung von Kommunikationsaufgaben, wie dem Kontakt mit Eltern, an andere institutionelle Mitglieder mithilfe digitaler Systeme könnte Kitaleitungen entlasten und die Bewältigung von Krisensituationen unterstützen.

Der administrative Mehraufwand während der Pandemie führte auf der Leitungsebene zu erhöhtem Workload und Zeitdruck. Das bereits breite Aufgabenspektrum wuchs weiter, wobei die Umsetzbarkeit in Frage steht. Eine mögliche Lösung wäre die Trennung von pädagogischen und organisatorischen Leitungsaufgaben, um den steigenden Anforderungen im Personalmanagement gerecht zu werden und die Weiterentwicklung von Organisationen gewährleisten. Verbindliche Aufgabenklärungen durch den Träger und eine vertiefte Akademisierung und Qualifizierung des Personals könnten die Bewältigung unterstützen, wobei professionelle Netzwerke und bessere Arbeitsbedingungen ebenfalls von Bedeutung sind (Oeltjendiers et al., 2021).

Die vorliegende Studie beleuchtete die Auswirkungen der COVID-19-Pandemie auf deutsche Kitas und hebt die Herausforderungen für Leitungskräfte hervor, die mit Überlastung einhergingen. Trotz der Belastungen bieten sich durch die Pandemie Möglichkeiten für Veränderungen im FBBE-Bereich, da Problemfelder aufgezeigt und Ansätze für Krisenfestigkeit und Institutionenentwicklung diskutiert werden können. Die erfolgreiche Implementierung digitaler Lösungen zeigt, dass Veränderungen im bisherigen FBBE-System möglich sind. Durch innovative Ansätze und verbesserte Rahmenbedingungen könnten bestehende und künftige Herausforderungen angegangen werden.

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**Elektronische Supplemente (ESM)**

***ESM 1. Interviewleitfaden***

**I. Rolle der Leitung**

**a. Rolle & Anforderungen**

Bitte beschreiben Sie Ihre Rolle als Kitaleitung in dieser Einrichtung.
Wie sehen Sie Ihre Rolle bei der Verwaltung der administrativen Aufgaben Ihrer Einrichtung?

**b. Ausbildung/ Fähigkeiten**

Fühlen Sie sich für Ihre Position gut ausgebildet?
Welche Fähigkeiten halten Sie für wichtig?

**c. Mitarbeiter*innen**

Wie gestalten Sie die Zusammenarbeit mit Ihren Mitarbeiter*innen?
Wie sprechen Sie generell oder auch mit Mitarbeiter*innen über die Zukunft/ Probleme oder anstehende Veränderungen in der Einrichtung?

**d. Entscheidungsverhalten**

Denken Sie bitte an eine Situation in Ihrem Berufsalltag, in der von Ihnen als Leitung verlangt wird, eine Entscheidung zu treffen.
Wie treffen Sie Ihre Entscheidungen?
Wie gehen Sie selbst an neue Aufgaben heran? Wie möchten Sie, dass an neue Aufgaben herangegangen wird?
Wie reagieren Sie, wenn etwas nicht so läuft, wie Sie es geplant haben?

**II. Vision/ päd. Profil**

**a. Werte & Umsetzung**

Welche Werte/ Überzeugungen haben Sie für und in der Arbeit mit Kindern?
- Wie ist der pädagogische Ansatz Ihres Kindergartens?
- Wie setzen Sie Impulse für die Weiterentwicklung der pädagogischen Arbeit?

**b. Kommunikation**

Wie kommunizieren Sie das pädagogische Profil Ihrer Einrichtung an das Team, die Eltern, die Kinder?
Sprechen Sie mit Ihren Mitarbeiter*innen über Ihre wichtigsten Überzeugungen und Werte für und in der Arbeit mit Kindern?

**c. Zusammenarbeit Eltern**

Wie arbeiten Sie mit den Eltern zusammen/binden Sie diese mit ein?

**III. Stress der Leitung**

**a. Herausforderungen**

Was sind die größten Herausforderungen bei Ihrer Arbeit? (in Bezug auf Ressourcen und in Bezug auf soziale / emotionale Herausforderungen)?
Was verursacht in Ihrer Funktion als Leitung für Sie den meisten Stress?
Was sind die Hauptherausforderungen bei der Verwaltung der administrativen Aufgaben der Einrichtung?

**b. Umgang Herausforderung**

Wie gehen Sie mit diesen Herausforderungen um?
Welche Unterstützung erhalten Sie, um die Herausforderungen zu bewältigen?

**IV. COVID**

Im Speziellen soll es nun um die Herausforderungen in Bezug auf die aktuelle Lage im Zusammenhang mit COVID-19 gehen.

- Wie wirkt sich die aktuelle Situation auf Ihre Arbeit aus?

Können Sie beschreiben, wie sich Ihre Arbeit als Kitaleitung verändert hat? Kurzfristig/ langfristig?

***ESM 2. Detailliertes Kodierschema mit Haupt- und Unterkategorien***

| Hauptkategorien<br>*Subkategorien* | Häufigkeit der Codes | |
|---|---|---|
| Auswirkungen auf institutioneller Ebene | n | % |
| Schnelle Umsetzung unklarer und unpraktikabler Corona-Verordnungen | 10 | (28,57%) |
| Umsetzen von Hygiene- und Schutzmaßnahmen | 14 | (40,00%) |
| Kontaktreduzierung durch Gruppentrennung | 9 | (25,71%) |
| Ungewissheit und ständige Veränderungen: Fehlende Planungssicherheit | 16 | (45,71%) |
| Abweichungen in der Ausführung genereller Leitungsaufgaben und im pädagogischen Alltag | 12 | (34,29%) |
| Auswirkungen auf interaktionaler Ebene | | |
| Zusammenarbeit mit Eltern und Familien | 11 | (31,43%) |
| Teamarbeit | 19 | (54,29%) |
| Auswirkungen auf Leitungsebene | | |
| Bürokratischer und organisatorischer Mehraufwand | 31 | (88,57%) |
| Entgrenzung der täglichen Arbeitszeit durch Wochenendarbeit und ständige Erreichbarkeit | 6 | (17,14%) |
| Psychisches Belastungserleben, Ängste und Sorgen | 15 | (42,86%) |
| Gesteigertes Gefühl der Verantwortung und Fürsorge | 17 | (48,57%) |
| Handeln entgegen eigenen Werten: Mentaler Spannungszustand | 6 | (17,14%) |
| Positive Auswirkungen aufgrund der COVID-19 Pandemie | 8 | (22,86%) |