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The Unseen Burden: Occupational Depression's Impact on Cognition and Work Performance in Norwegian Workers

Master's thesis in Work and organizational psychology

Supervisor: Renzo Bianchi

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Preface

This master's thesis marks the end of my five-year academic journey in psychology at NTNU. Through a lecture, I became aware of occupational depression, and my interest in this novel approach to job-related distress started to grow. Through conversations and feedback from my supervisor, Renzo, I refined my research question. I decided to investigate the influence of occupational depression on cognition and work performance, exploring both the presence and extent of its impact. I conducted all analyses and collected all data for this study. Additionally, I designed the survey used for data collection, refining it based on feedback from my supervisor.

There are many people I would like to thank for their support of this thesis. First and foremost, I want to thank my supervisor, Renzo Bianchi, for his invaluable feedback, quick responses, consistent availability, and support throughout this process. I would also like to thank my fellow students for our enriching discussions and enjoyable breaks. Lastly, I want to express my gratitude to my family and friends for their continuous support throughout this journey.

Abstract

There is a growing recognition of mental health issues within society, with depression emerging as the most prevalent mental disorder. The impact of depression on the workforce is multifaceted, affecting societal, organizational, and individual levels. Drawing upon extensive research on stress and depression, the Occupational Depression Inventory (ODI) was developed to assess job-related distress, offering a novel alternative to traditional burnout evaluations. This study used the ODI to examine whether and how work-attributed depressive symptoms impact cognition and work performance. The study relied on a sample of 131 Norwegian workers. Analytical methods employed to test the study's hypotheses included correlational and regression analyses, independent t-tests, and mediation analysis. The results indicated that higher levels of work-attributed depressive symptoms were associated with poorer task performance, increased engagement in counterproductive work behavior, and greater perceived cognitive impairment. However, the study did not find significant associations between occupational depression and either objective cognitive performance or contextual performance. I tillegg fant studien ingen bevis for at opplevd kognitiv svikt medierte forholdet mellom yrkesdepresjon og oppgaveprestasjon. These results highlight the profound impact of occupational depression on workplace functionality and emphasize the importance of addressing mental health in occupational settings.

Keywords: Job-related distress, burnout, depression, occupational depression inventory, cognition, work performance

Sammendrag

Det er en økende erkjennelse av psykiske helseproblemer i samfunnet, med depresjon som den mest utbredte psykiske lidelsen. Virkningen av depresjon på arbeidsstyrken er mangefasettert, og påvirker samfunnsmessige, organisatoriske og individuelle nivåer. Med utgangspunkt i omfattende forskning på stress og depresjon ble «Occupational Depression Inventory» (ODI) utviklet for å vurdere jobbrelatert stress, og tilbyr et nytt alternativ til tradisjonelle utbrenthetsvurderinger. Denne studien brukte ODI for å undersøke om og hvordan jobb-attribuerte depressive symptomer påvirker kognisjon og jobbytelse. Studien baserte seg på et utvalg bestående av 131 norske arbeidere. Analytiske metoder brukt for å teste studiens hypoteser, inkluderte korrelasjons- og regresjonsanalyser, uavhengige t-test og medieringsanalyse. Resultatene indikerte at høyere nivåer av jobb-relaterte depressive symptomer var assosiert med dårligere oppgaveprestasjon, økt engasjement i kontraproduktiv arbeidsatferd, og større opplevd kognitiv svekkelse. Imidlertid fant ikke studien signifikante bevis for en sammenheng mellom yrkesdepresjon og verken objektiv kognitiv prestasjon eller kontekstuell prestasjon. I tillegg fant studien ingen bevis som støtter opplevd kognitiv svekkelse som en mediator mellom yrkesrelatert depresjon og oppgaveprestasjon. Disse resultatene fremhever den dype innvirkningen yrkesdepresjon har på arbeidsplassens funksjonalitet og understreker viktigheten av å ta opp psykisk helse i yrkessammenhenger.

Stikkord: Jobbrelatert stress, utbrenthet, depresjon, «occupational depression inventory», kognisjon, jobbytelse

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The Unseen Burden: Occupational Depression's Impact on Cognition and Work Performance in Norwegian Workers

There is a growing concern for mental health in contemporary society. The keen interest in mental well-being has been growing for good reason. Depression is regarded as a common mental disorder by the World Health Organization (WHO) (Marcus et al., 2012). Depression substantially contributes to the global burden of disease, affecting an estimated 322 million individuals worldwide in 2015, as reported by the WHO in 2017. The onset of the COVID-19 pandemic further exacerbated mental health challenges, with WHO revealing a 25% increase in the prevalence of anxiety and depression globally in the initial year of the crisis (World Health Organization [WHO], 2022). Aligned with the increasing global emphasis on mental health, a parallel surge in concern has been observed within occupational settings (Barling & Cloutier, 2017; Wu et al., 2021).

Job-related stress has been identified as a major occupational risk factor that can cause employees psychological, physical, and social harm (Hassard et al., 2018; Theorell et al., 2015). In individuals without apparent susceptibility to depression, the emergence of depressive symptoms and disorders has been linked to situations of unresolvable stress (Bianchi & Schonfeld, 2021; Bonde, 2008; Grahek et al., 2019; Willner et al., 2013). Hence, examining the issue of job-related distress in the field of depression research appears to be relevant (Bianchi et al., 2022a). The Occupational Depression Inventory (ODI) was developed in 2020 with the purpose of assessing depressive symptoms that individuals specifically attribute to their work (Bianchi & Schonfeld, 2020). In a meta-analysis conducted by Theorell et al. (2015), moderately strong evidence emerged indicating that factors like job strain, low decision latitude, and workplace bullying have a notable impact on the development of depressive symptoms. The consequences of depression among the working population are manifold and can have an impact on societal, organizational, and individual levels (Hassard et

al., 2018; Theorell et al., 2015). At the societal level, depression poses a solid financial burden. In the United States, the economic cost of depression was estimated at 326 billion U.S. dollars in 2018 (Greenberg et al., 2021). In Norway, the estimated cost of mental disorders is 340 billion Norwegian kroner per year (Norwegian Directorate of Health, 2019). Among these disorders, depression is one of the most economically burdensome (Holte, 2024).

Organizationally, depression can have substantial indirect costs. Most studies use lost productive time (LPT), which refers to absenteeism and presenteeism. Absenteeism is the LPT resulting from missed hours or days of work, while presenteeism is the estimated LPT resulting from reduced work performance during working hours (Woo et al., 2011). Concerning absenteeism, the Directorate of Labor and Welfare (NAV) reported that 25% of all sick leave in Norway in 2023 was due to mental disorders, where depression was among the most frequent causes (Moberg, 2023). This underscores the growing challenges organizations face in managing the impact of mental health on employee well-being. In the context of presenteeism, depression has demonstrated a significant impact on both work productivity and performance (Gagan et al., 2013; Lerner et al., 2010; Lerner & Henke, 2008; Woo et al., 2011). Notably, research indicates that the productivity loss from presenteeism exceeds that of absenteeism for depression (Stewart et al., 2003). Additionally, varying severities of depression, from mild to severe, have been associated with a reduction in work performance (Gagan et al., 2013).

Depression on its own is a predictor of several illnesses and morbidities (Bianchi & Schonfeld, 2020), such as cardiovascular disease (Elderon & Whooley, 2013; Hare et al., 2014) and diabetes (Sartorius, 2018). Moreover, depression poses an elevated risk of mortality, as it is also a prime risk factor for suicide (Bianchi & Schonfeld, 2020; Chesney et al., 2014; Hawton et al., 2013). In addition to its significant impact on quality of life,

depression is also associated with impairment in cognitive functioning, such as memory, attention, and decision-making (McIntyre et al., 2013; Pan et al., 2019; Rock et al., 2014; Scult et al., 2017). These cognitive impairments are thought to play a mediating role in the relationship between clinical depression and psychosocial impairment, contributing to deterioration in various aspects, including job performance (Bianchi & Schonfeld, 2021; Lam et al., 2014; McIntyre et al., 2013; Pan et al., 2019).

To my knowledge, there is a scarcity of research on depression and its effects on work performance and cognition among Norwegian workers. This critical knowledge gap requires attention, aiming to unveil the possible consequences of occupational depression in the Norwegian workforce. More comprehensive insights into this issue can empower occupational health specialists to design more effective work-centered interventions and establish robust support systems. These initiatives aim to either prevent the onset of occupational depression or, in cases where it has already occurred, facilitate timely and targeted interventions to mitigate its impact on individual well-being and work performance. This study addresses the following research question: “How does occupational depression relate to cognition and work performance in a sample of Norwegian workers?”

Background

Shortcomings of Burnout

The comprehensive term "job-related distress" encompasses the adverse psychological effects resulting from excessive stress in the workplace. Historically, the conceptualization of job-related distress has been predominantly associated with the concept of burnout. Burnout is widely agreed upon to comprise three symptomatic dimensions: (emotional) exhaustion, cynicism (alternatively referred to as depersonalization), and inefficacy (or reduced personal accomplishment) (Maslach et al., 2001). Exhaustion refers to the feeling of being emotionally and physically drained, typically because of excessive work demands. Cynicism is

characterized by an apathetic or detached attitude towards work in general and the people one works with. It culminates in a loss of interest and a sense that work has lost its meaning. Lastly, inefficacy refers to diminished feelings of competence, achievement, and success within one's role and the organization (Maslach et al., 1997). This triad of symptoms forms the core of the burnout construct, providing a framework for understanding the multifaceted nature of job-related distress.

Although burnout has been the primary construct utilized in assessing job-related distress, there are several limitations related to its use (Bianchi et al., 2022b; Cox et al., 2005; Rotenstein et al., 2018; Schwenk & Gold, 2018). A limitation is the absence of a unified definition and established diagnostic criteria for burnout, resulting in varied operationalizations and interpretations of the construct among researchers (Bianchi et al., 2022b; Heinemann & Heinemann, 2017; Nadon et al., 2022; Plieger et al., 2015). In a systematic review of 182 studies on physician distress, Rotenstein et al. (2018) found that 142 of the studies included in the review had different characterizations of burnout. The lack of consensus regarding the definition of burnout complicates efforts to validate it as a mental disorder (Nadon et al., 2022). This definitional ambiguity renders burnout diagnosis impossible, thereby posing a challenge for occupational health specialists tasked with identifying cases of burnout, ascertaining prevalence, and treating individuals with burnout (Bianchi et al., 2022b; Sowden et al., 2022).

Another limitation pertains to the discriminant validity of burnout. A longstanding debate concerns the potential overlap between burnout and depression (e.g., Ahola et al., 2005; Bianchi et al., 2015a; Leiter & Durup, 1994). Even in what is considered the first article about burnout, Freudenberger (1974) stated: "The person looks, acts and seems depressed" (p. 161). Regarding this debate, several studies have found that depressive symptoms correlate highly with burnout symptoms, showing an overlap between the two constructs (Bianchi et

al., 2021; Bianchi & Brisson, 2019; Chen & Meier, 2021; Rotenstein et al., 2021; Schonfeld & Bianchi, 2016; Sowden et al., 2022). Determining the difference or overlap between depression and burnout is crucial. Failure to differentiate or overlook the overlap between the two conditions could lead to misdiagnosis and inappropriate treatment. As stated by Bianchi et al. (2014): “depending on whether burnout is primarily characterized as a fatigue or a depressive syndrome, different measures should be taken” (p. 310). The observed overlap between burnout and depression has made researchers question whether burnout represents a distinct psychological phenomenon or simply constitutes a dimension of depression (Bianchi et al., 2015b).

From Burnout to Depression

In light of the debate, Bianchi and Schonfeld (2020) proposed a shift from burnout to occupational depression. Depression is a common mental disorder that rests on firm clinical and empirical research. Primarily, it is characterized by dysphoric mood (i.e., sad, empty, or irritable mood) and anhedonia (i.e., loss of interest or pleasure in activities that were previously considered pleasurable) (American Psychiatric Association [APA], 2013). Depression is nosologically defined and diagnosable. Even though it is often approached categorically (no diagnosis vs. diagnosis), it can also be approached dimensionally, where depressive symptoms vary in severity along a continuum, with a depressive disorder representing the far end of the continuum. In this manner, exhibiting depressive symptoms does not automatically result in a diagnosis of clinical depression (Bianchi, 2020; Haslam et al., 2012; Wichers, 2014).

Researchers advocating for a distinction between burnout and depression primarily emphasize burnout's contextual grounding in the workplace, contrasting with the context-free nature of depression. Following this view, burnout is uniquely linked to an individual's workplace, while depression can manifest itself regardless of the circumstances of the

environment (Koutsimani et al., 2019; Sowden et al., 2022). However, it should be highlighted that the argumentation for this distinction may not be entirely accurate because the early phases of depression may be domain-specific (Rydmark et al., 2006). Building on this, several researchers have found that job-related stress can trigger depressive symptoms and depressive disorders (e.g., Melchior et al., 2007; Theorell et al., 2015; Wang, 2005; Yoon & Kim, 2013). Demonstrating that, similar to burnout, depressive symptoms may appear as a result of chronic stress at work.

Transitioning to (occupational) depression may offer numerous advantages. In contrast to burnout, depression is nosologically defined and diagnosable, as mentioned earlier. This may benefit occupational health specialists in that they may be able to more effectively address the problem of unresolvable stress at work (Bianchi et al., 2019). It may also make it easier for researchers to identify cases of occupational depression and estimate the prevalence of the condition. Additionally, occupational health specialists may benefit from already empirically proven approaches to treatment and prevention of depression (Cuijpers et al., 2009). Depression, being a clinical condition, also has practical implications for protecting workers, especially regarding rights such as sick pay and sick leave (Sowden et al., 2022). A transition is recommended by Bianchi et al. (2019) when stating: “Turning to job-related depression offers occupational health specialists a credible way out of the “burnout impasse” (p. 42).

Occupational Depression Inventory (ODI)

The ODI represents a new approach to understanding job-related distress, drawing upon extensive research on stress and depression (Bianchi & Schonfeld, 2020). The ODI derives its foundation from the diagnostic criteria for major depression outlined in the DSM-5 (APA, 2013). Consequently, the nine symptom items that constitute the ODI are aimed at assessing anhedonia, depressed mood, sleep alterations, fatigue/loss of energy, appetite

alterations, feelings of worthlessness, cognitive impairment, psychomotor alterations, and suicidal ideation. The ODI does not assess depressive symptoms in a “cause-neutral” manner, like other classic depression scales. Instead, the items involve causal attributions to individuals’ work. As an illustration, rather than asking respondents if they feel worthless (a symptom of major depression), the ODI asks respondents whether their experiences at work made them feel worthless (Bianchi & Schonfeld, 2020). It is interesting to notice that the ODI evaluates symptoms that are allegedly at the core of the experience of burnout, which are exhaustion, lack of motivation, and a sense of failure. Also, a variety of additional symptoms are evaluated by the ODI, such as cognitive impairment and suicidal ideation (Bianchi et al., 2022b).

The ODI has a dual-lens approach. It both quantifies the severity of work-attributed depressive symptoms (dimensional approach) and establishes a provisional diagnosis of job-ascribed depression (categorical approach) (Bianchi & Schonfeld, 2020). It is noteworthy that the diagnosis is provisional because a formal clinical diagnosis must be made by a trained clinician. Within the framework of the ODI, dimensions and categories are treated as two complementary perspectives on the phenomenon under investigation. For a researcher trying to explore the prevalence of the phenomenon or identify people who need help, a categorical approach will be of more relevance. For a researcher investigating the dynamic of symptom development for occupational depression, a dimensional approach may be preferred (Bianchi et al., 2022b). Because the ODI is based on a well-known classification system and has few items, it is easy to use.

Thus far, the ODI has been validated in English, French, Italian, Spanish, Brazilian-Portuguese, Polish, Ukrainian, Persian, and Swedish. Its utilization spans various nations such as the USA, New Zealand, France, Spain, Switzerland, South Africa, Brazil, Poland, and Ukraine. Data gathered from these diverse contexts provide evidence supporting the reliability

and validity of the ODI as an instrument. McDonald's omegas and Cronbach's alphas were observed to be around 0.90. (Bianchi et al., 2023; Bianchi et al., 2022a; Bianchi & Schonfeld, 2020; Bianchi et al., 2022b; Golonka et al., 2024; Hill et al., 2021; Kalani et al., 2024). More advanced statistical techniques (e.g., exploratory structural equation modeling bifactor analysis) have found that the ODI meets the requirement for essential unidimensionality (Bianchi et al., 2022b). When researchers examined criterion validity, the ODI demonstrated associations with various work-related and non-work-related variables. These include job satisfaction, willingness to stay in the job, work engagement, work overload, turnover intention, general health status, life satisfaction, and objective cognitive performance (Bianchi et al., 2023; Bianchi et al., 2022a; Bianchi & Schonfeld, 2020; Bianchi & Schonfeld, 2022; Hill et al., 2021; Kalani et al., 2024). Despite being recently developed, the ODI stands as a robust tool for assessing depressive symptoms attributed to occupational adversity. Moreover, there remains a need for further exploration into the ramifications of occupational depression.

Cognition and Depression

Cognition refers to the broad set of mental processes involved in acquiring, processing, storing, and using information. It encompasses various aspects of thinking, including perception, attention, memory, executive functions, reasoning, problem-solving, decision-making, and language comprehension (Annunziata et al., 2012). In order to operate in daily life, cognitive function must be intact. Even little deficiencies can cause consequences for the affected individual. This may involve difficulty performing regular activities or hobbies, as well as experiencing decreased motivation or productivity at home, school, or work (Naismith et al., 2007). Cognitive impairments are widely recognized as a significant component of major depressive disorder (MDD) (Snyder, 2013). The DSM-5 includes “diminished ability to think or concentrate, or indecisiveness, nearly every day

(either by subjective account or as observed by others).” As a diagnostic criterion for MDD (APA, 2013, p. 161).

Consistent with the DSM-5, several literature reviews and meta-analyses have shown that individuals with depression display small to large impairments across most cognitive domains, such as executive functions, decision-making, memory, and attention (Ahern & Semkovska, 2017; McIntyre et al., 2013; Rock et al., 2014; Semkovska et al., 2019; Snyder, 2013). Ahern and Semkovska (2017) conducted a systematic review and meta-analysis to examine the pattern and extent of cognitive deficits during a first episode of depression (FED) and their persistence following remission from FED. They discovered varying degrees of impairment across several cognitive domains, ranging from small to large, compared to healthy controls. During the remission phase, they observed slight improvements in functions, such as processing speed, learning, and memory, while others continued to display persistent impairment. Rock et al. (2014) reported findings largely consistent with Ahern and Semkovska’s study (2017) in their meta-analysis.

Research on occupational depression and cognitive functioning has shown consistent findings with the research on clinical depression (Bianchi et al., 2022a; Bianchi & Schonfeld, 2021, 2022). In their study, Bianchi and Schonfeld (2022) investigated the relationship between occupational depression, measured using the ODI, and objective cognitive performance, focusing particularly on domains such as effortful reasoning and effective decision-making. Employing both dimensional and categorical analyses, they observed a negative predictive relationship between ODI scores and cognitive performance. Consistent with findings in clinical depression research, the associations Bianchi and Schonfeld (2022) reported were small to moderate in size. This observation further substantiates the criterion validity of the ODI, as mentioned previously.

While much of the existing research on cognitive deficits in depression focuses on objective measures (e.g., Ahern and Semkovska, 2017; Rock et al., 2014; Semkovska et al., 2019), it is important to consider the perceived cognitive impairment reported by individuals themselves. One reason is that depression is theorized to involve distorted thinking that leads to negative thoughts and changes in mood, which furthermore play a role in the development and maintenance of depressive symptoms (Gotlib & Joormann, 2010). These distorted thinking patterns may also contribute to individuals endorsing symptoms of cognitive impairment, even if objective deficits are not present (Beck, 1963). In fact, several studies have indicated inconsistent correlations between actual cognitive performance and perceived cognitive impairment (Dhillon et al., 2020; Lahr et al., 2007; Mowla et al., 2008; Schweizer et al., 2018; Svendsen et al., 2012). They demonstrate that subjective complaints often surpass the severity of deficits observed in neuropsychological tests. Lahr et al. (2007) offered a plausible explanation for this discrepancy, positing that individuals with depression may harbor a negatively biased self-perception, leading to an exaggeration of subjective deficits, which do not show on the objective measurements. Understanding the cognitive impairments associated with depression is essential, as these can influence an individual's ability to function effectively in daily activities, including work.

Individual Work Performance

Individual work performance (IWP) is a frequently utilized metric in occupational studies. Over the past decades, considerable research within disciplines like management, occupational health, and industrial-organizational psychology has been dedicated to identifying the factors influencing and consequences of IWP (Koopmans et al., 2013). IWP is defined as “behaviors or actions that are relevant to the goals of the organization.” (Campbell, 1990, p. 704). This definition also emphasizes that the behaviors are under the control of the individual, therefore precluding behaviors that are constrained by the environment. Thus, the

measurement of IWP places more emphasis on the acts or behaviors that employees display than on the outcomes or results that arise from these actions (Rotundo & Sackett, 2002). IWP is considered a multidimensional construct, and based on several reviews of the literature (Koopmans et al., 2011; Rotundo & Sackett, 2002; Viswesvaran & Ones, 2000), there is a consensus that it consists of three broad dimensions: task performance, contextual performance, and counterproductive work behavior (CWB). These dimensions offer a relatively thorough and concise method for assessing overall job performance (Dalal et al., 2012).

Despite a general agreement on the components of IWP, its conceptualization and operationalization have varied across disciplines. Addressing this issue, Koopman et al. (2011) synthesized insights from 16 generic and 18 job-specific frameworks, presenting a more cohesive understanding of IWP. Their heuristic framework also incorporated a fourth dimension, adaptive performance. Subsequently, they utilized this framework to develop an Individual Work Performance Questionnaire (described in a later section) (Koopman et al., 2013). Interestingly, when factor-analyzing the measure, it became apparent that adaptive performance was not a distinct dimension. Instead, it emerged as an aspect of contextual performance (Koopman et al., 2013). Consequently, the three primary dimensions predominantly utilized in this context are task performance, contextual performance, and CWB.

The first dimension, task performance, can be defined as “the proficiency (i.e., competency) with which individuals perform the core substantive or technical tasks central to his or her job.” (Campbell, 1990, pp. 708-709). It encompasses behaviors that vary based on the nature of the work, are often specified by the individual's role, and are typically specified in the job description. The definition of core job tasks will vary across different professions. Finding universally applicable frameworks for task performance is challenging, leading to a

preference for context-specific frameworks better suited to particular environments or roles. In Koopmans et al.'s (2011) more generic framework, several indicators of task performance are considered, including the completion of job tasks, maintenance of current knowledge, execution of work with accuracy and neatness, effective planning and organizing, and problem-solving capabilities, among other factors.

Contextual performance (also referred to as organizational citizenship behavior) is the second dimension. It is defined as “individual behaviors that support the organizational, social, and psychological environment in which the technical core must function” (Borman & Motowidlo, 1993, p. 73). This dimension includes behaviors that go beyond the formally prescribed work goals, such as undertaking additional tasks, showing initiative, proactivity, or leading and developing others (Koopmans et al., 2011). The difference from task performance is that contextual performance enhances the organization's overall functioning, but it does not necessarily directly impact individual workers' productivity (Ramos-Villagrasa et al., 2019). Although task and contextual performance are distinct dimensions, they are positively correlated (Koopmans et al., 2011).

The third dimension is CWB. CWB can be defined as “behavior that harms the well-being of the organization.” (Rotundo & Sackett, 2002, p. 69). This dimension includes behaviors such as being late for work, absenteeism, presenteeism, engaging in off-task behavior, and showing excessive negativity (Koopmans et al., 2011). These deviant behaviors are associated with adverse outcomes at both the personal and organizational levels (Ramos-Villagrasa et al., 2019). In a meta-analysis by Dalal (2005), a modest negative relation was found between contextual performance and CWB. Although there is a significant relationship between them, the meta-analysis highlighted that each of the two dimensions possesses unique patterns and distinct identities.

The conceptual framework established by Koopman et al. (2011) provides a foundational understanding of the essential aspects of work performance. This advancement has multiple benefits. It offers a solid basis for creating and executing workplace interventions and assessing their effect on IWP. For example, intervention studies that target employee lifestyle and health to increase an individual's work performance. Concerning this, one can also look at the causes and consequences of IWP (Koopman et al., 2011; Koopman et al., 2013). A framework like this can open the door to investigating how factors such as depression influence work performance.

Depression and Work Performance

Depression is one of the most common health issues encountered in the work environment (Arocena & Nuñez, 2014; Woo et al., 2011). Depression often has an early onset and can persist or reoccur, causing impairment in daily activities (Stander et al., 2016). Links between depression and absenteeism in the workplace have been frequently documented (Gagan et al., 2013; Stander et al., 2016). Over time, there has been a growing emphasis on research exploring the impact of depression on work performance and productivity due to presenteeism. In a paper by Lerner & Henke (2008), the job performance of depressed employees was found to be impaired 35% of the time or more on average.

Most research on the relationship between depression and work performance centers on productivity and various elements associated with the task performance dimension (e.g., Adler et al., 2006; Johnston et al., 2019; Gagan et al., 2013; Woo et al., 2011). Numerous studies have consistently demonstrated that depression affects both productivity and performance in the workplace (Beck et al., 2011; Gagan et al., 2013; Harvey et al., 2011; Johnston et al., 2019; Lerner & Henke, 2008; Stander et al., 2016; Woo et al., 2011). For example, Gagan et al. (2013) looked at the association between depression severity, absenteeism, and presenteeism. They found that reduced productivity was observed across all

levels of depression (mild to severe), with presenteeism and absenteeism worsening as the degree of depression increased. Arocena and Nuñez (2014) investigated gender differences in the association between depression and work performance. After controlling for type of occupation, employment conditions, and various relevant socioeconomic factors, gender did not significantly contribute to explaining how depression impacts work performance. Woo et al. (2011) examined performance changes in individuals who underwent eight weeks of outpatient psychiatric treatment, including antidepressant therapy. Their study revealed an association between the reduction of depression symptoms and improvements in self-rated job performance. This indicates that interventions designed to alleviate depressive symptoms can positively impact work performance.

There has been limited research exploring the relationship between depression and the dimensions of contextual performance and CWB. The research on contextual performance has shown inconsistent findings. Jeong and Lee (2022) discovered that Korean service workers who encountered mistreatment from customers were more prone to experiencing depression at work, resulting in a decline in their contextual performance. A meta-analysis looking at relationships between psychological, physical, and behavioral health and work performance by Ford et al. (2011) found a negative correlation between depression and contextual performance. This can be attributed to the fact that one characteristic of depression includes a diminished or complete lack of action and motivation (Smith, 2013), resulting in decreased contextual performance. Conversely, Singh and Bhuvaneshwari (2023) discovered a positive correlation between depression and contextual performance. A possible explanation they give is that helping others can serve as a beneficial diversion by redirecting individuals' focus away from their own bad emotions onto those of others.

As previously noted, research exploring the connection between depression and CWB is scarce. The study by Singh and Bhuvaneshwari (2023) found no significant relationship

between the two variables. However, other studies have investigated different aspects related to depression and their association with CWB (Dalal, 2005; Mount et al., 2006; Penney & Spector, 2005; Spector & Fox, 2002). For example, consistent findings have shown that negative affectivity positively correlates with CWB (Dalal, 2005; Dalal et al., 2012; Penney & Spector, 2005; Spector & Fox, 2002). Additionally, research has examined the link between job satisfaction and CWB, revealing that individuals with lower job satisfaction are likelier to engage in CWB (Dalal, 2005; Mount et al., 2006; Penney & Spector, 2005). This finding is particularly relevant considering that literature indicates that people with depression (Capone & Petrillo, 2020; Ferguson et al., 2012; Zhang & Chai, 2020) and also occupational depression (Bianchi & Schonfeld, 2020) often experience reduced job satisfaction. Consequently, it can be inferred that individuals with depression may be more inclined to exhibit increased CWB.

Depression, Cognition, and Task Performance

Individuals with depression exhibit decreased psychosocial functioning (McIntyre et al., 2013). As a consequence, those suffering from depression frequently report that the condition impacts their work performance, manifesting either as reduced productivity at work or through increased absenteeism (Lam et al., 2014). Given that cognitive complaints are fundamental symptoms of major depressive episodes and that a reduced ability to think or concentrate, along with indecisiveness, are diagnostic criteria. Researchers have started to look at cognitive dysfunction as a principal mediator of functional impairment, notably work performance for people with depression (Buist-Bouwman et al., 2008; McIntyre et al., 2013; McIntyre et al., 2015; Woo et al., 2016).

Research has shown that cognitive impairments in individuals with depression, including issues with memory, attention, and executive functioning, significantly influence their capacity for efficient and effective task performance. Notably, McIntyre et al. (2015)

discovered that variations in workplace performance are more substantially accounted for by subjective assessments of cognitive dysfunction than by the overall severity of depressive symptoms. Even among individuals in a remission phase, cognitive deficits continue to act as a mediator of occupational impairment (Woo et al., 2016). Recognizing the potential mediating role of cognitive impairments is essential when considering the broader impacts of depression on workplace performance. The cognitive challenges that accompany depression, such as difficulties with memory, attention, and decision-making, may serve as critical factors through which depression exerts its influence on an individual's capacity to perform work tasks effectively.

Present Study

In this study, I investigate the relationship between occupational depression and several key factors: objective cognitive performance, perceived cognitive functioning, and work performance, which encompasses task performance, contextual performance, and CWB. Drawing upon the insights from the aforementioned research, I have formulated seven hypotheses. The hypotheses are as follows:

H1: Work-attributed depressive symptoms will be negatively associated with objective cognitive performance.

H2: Individuals with higher levels of work-related depressive symptoms will show poorer objective cognitive performance compared to individuals with lower levels of work-related depressive symptoms.

H3: Work-attributed depressive symptoms will be positively associated with perceived cognitive impairment.

H4: Work-attributed depressive symptoms will be negatively associated with task performance.

H5: Work-attributed depressive symptoms will be negatively related to contextual performance.

H6: Work-attributed depressive symptoms will be positively associated with counterproductive work behavior.

H7: The effect of work-attributed depressive symptoms on task performance is mediated by perceived cognitive impairment.

Method

Design

The study employed a quantitative approach and a cross-sectional design. The dataset was gathered through a self-administered digital questionnaire. The survey comprised measures of occupational depression, work performance, subjective cognitive impairment, objective cognitive performance, and transient moods. An attention-check item was also integrated to identify participants who might not have been attentive. Concluding the survey was a message encouraging participants to seek assistance if they were experiencing feelings of distress. Contact information was included in case the participants had questions regarding the study.

Sample

The study initially involved 138 participants. However, seven participants were excluded due to failing the attention-check item, resulting in a final sample of 131 participants. Within this group, 47% ($n = 62$) were men, and 53% ($n = 69$) were women. In terms of age distribution, 34% ($n = 45$) were aged between 18 and 34 years (early career), 27% ($n = 36$) fell within the 35 to 49 age range (mid-career), and 38% ($n = 50$) were 50 years or older (late career). Participation in the study required meeting two criteria: 1) being currently employed and 2) 18 years or older.

Measures

Transient Mood

Participants expressed their current emotional state the day they took the questionnaire, using three items reflective of the positive mood, dejected mood, and irritable mood triad (Bianchi & Schonfeld, 2022). The items were “I feel fine/I am in a good mood”, “I feel down/demoralized”, and “I feel angry/irritated.” Items were rated on a five-point scale (from 1 for “strongly agree” to 5 for “strongly disagree”).

Individual Work Performance Questionnaire

IWP was measured using the Individual Work Performance Questionnaire 1.0 (IWPQ) (Koopmans et al., 2014). The IWPQ consists of 18 items, divided into three dimensions: task performance, contextual performance, and CWB. The IWPQ employs a response format using a five-point rating scale. Task performance and contextual performance range from seldom, sometimes, frequently, often, to always. For CWB, it ranges from never, seldom, sometimes, frequently, to often. All of the items have a recall period of three months (Koopmans et al., 2014). The mean score for each IWPQ scale can be computed by summing the item scores and dividing the total by the number of items in the scale. As a result, the IWPQ produces three scale scores, ranging from 1 to 5, where higher scores correspond to higher task and contextual performance and CWB. The reliability of the IWPQ dimensions was satisfactory across all scales. The task performance scale (5 items) showed good reliability with a Cronbach’s $\alpha = .83$ and a McDonald’s $\omega = .83$. Similarly, the contextual performance scale (8 items) exhibited a Cronbach’s $\alpha = .85$ and a McDonald’s $\omega = .85$. For the CWB scale (5 items), the coefficients were $\alpha = .82$ and $\omega = .82$.

Cognitive Functioning Self-Assessment Scale

The Cognitive Functioning Self-Assessment Scale (CFSS) is a questionnaire that assesses cognitive functioning (Annunziata et al., 2018; Annunziata et al., 2012). The CFSS

comprises 18 items that cover cognitive domains such as spatial-temporal orientation, attention, and memory. Each item reflects a daily activity that involves one or more of these domains (e.g., “It is difficult for me to find my way around in reaching a place/destination”). Participants were asked to consider the last 12 months and evaluate, using a five-point scale (ranging from one representing “never” to five representing “always”), the frequency with which they engaged in any of these activities. The scale has one dimension. The mean score for the scale can be computed by summing the item scores and dividing the total by the number of items in the scale. Higher values on the instrument’s overall score represent a worse self-perception of cognitive functioning (Annunziata et al., 2012). The CFSS scale (18 items) exhibited a Cronbach’s $\alpha = .88$ and a McDonald’s $\omega = .87$.

Cognitive Reflection Test

The Cognitive Reflection Test (CRT) assessed participants’ cognitive performance. Participants answered the six-item version of the CRT developed by Primi et al. (2016). The CRT was designed to measure an individual's inclination to disregard an intuitively compelling response and instead involve themselves in additional reflection, potentially leading to a correct solution (Frederick, 2005). The CRT, therefore, focuses on inhibitory control and reflection efficiency, highlighting two important aspects of cognitive functioning (Bianchi & Schonfeld, 2022). An example item is: “If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?” The heuristic “intuitive” answer is 100 minutes; the correct answer is 5 minutes.

Even though the CRT focuses on inhibitory control and reflection efficiency, it shows correlations with various measures of intelligence and general cognitive ability (Bianchi & Schonfeld, 2022; Primi et al., 2016). In this study, the CRT was employed with a response format consisting of four options, following the suggestion outlined in the article written by Sirota and Juanchich (2018). The four options available for the participants were a correct

answer, an incorrect intuitive heuristic answer, and two incorrect nonintuitive answers. A score of 1 was assigned to a correct answer, while any incorrect response received a score of 0. Consequently, CRT mean scores ranged from 0 to 1. The CRT (6 items) had some lower reliability values but still acceptable with Cronbach's $\alpha = .76$ and McDonald's $\omega = .78$

Occupational Depression Inventory.

ODI is a self-report inventory that comprises nine core symptom items (Bianchi & Schonfeld, 2020). The ODI includes a subsidiary question concerning turnover intention that was not used in this study. The ODI does not assess depressive symptoms in a “cause-neutral” manner; instead, the items involve causal attributions to participants' work/job (e.g., “My work was so stressful that I could not enjoy the things that I usually like doing.”) (Bianchi & Schonfeld, 2020). Before answering, the participants were informed that these items measured their work experience. The items were rated on a four-point scale, ranging from 1, “never or almost never,” 2, “a few days only,” 3, “more than half the days,” to 4, “nearly every day.” Consequently, ODI mean scores ranged from 1 to 4.

The ODI is designed to offer two distinct approaches: dimensional and categorical (Bianchi & Schonfeld, 2020). In the dimensional approach, the work-attributed depressive symptoms are reflected in the mean score, where higher scores signify higher depressive symptoms. The provisional diagnosis is based on an algorithm created by Bianchi and Schonfeld (2020). To get a provisional diagnosis, an individual needs to exhibit a score of 4 on at least five of the nine ODI symptom items, and one of these symptom items is anhedonia (item 1) or depressed mood (item 2). Importantly, suicidal ideation (item 9) counts with a score of 2 or 3 (Bianchi & Schonfeld, 2020).¹ In the algorithm, particular weight has been placed on the symptom of suicidal ideation due to its alarming status (APA, 2013; Bianchi &

¹ The present study used a 1-4 rating scale instead of the original 0-3 rating scale.

Schonfeld, 2020; Simon et al., 2018). The reliability of the ODI was also satisfactory, with Cronbach's $\alpha = .89$ and McDonald's $\omega = .90$.

Procedure

Before commencing the actual data collection, preliminary pilot studies were conducted to refine the survey. This phase was crucial for gathering feedback on the survey's design, content, and usability. Based on the responses and insights obtained from these pilot studies, adjustments and finalizations were made to the survey. The pilot studies were conducted with individuals from diverse backgrounds, ensuring a broad range of perspectives and insights.

The data was gathered from November 2023 to February 2024 using two sampling methods. Initially, convenience sampling was employed, where participants were recruited through personal contacts, social media platforms such as LinkedIn, and by reaching out to various organizations. Subsequently, snowball sampling was implemented, encouraging participants to share the survey with their contacts and repost it on social media. The survey was made available through a hyperlink.

Upon clicking the provided hyperlink, participants were directed to nettskjema.no, where the survey was hosted. The initial page of the survey displayed essential information for obtaining informed consent. To proceed with the survey, participants were required to respond affirmatively to a question confirming their understanding of the information provided and consent for their data to be used in the study. Once consent was provided, participants responded to sociodemographic items, followed by the transient mood measure. Subsequently, they were presented with the IWPQ, the CFSS, and the CRT. The ODI was administered at the end of the survey. The placement of the ODI after the CRT was strategic, intended to obscure the study's primary objective and reduce potential bias in responses.

The study was conducted in accordance with the ethical guidelines of Sikt, the Norwegian Agency for Shared Services in Education and Research (See Appendix A for approval from Sikt). Participation in the survey was voluntary. Confidentiality was guaranteed to all participants. Participants were given the freedom to withdraw from the survey at any time. In a commitment to preserving participant anonymity, the only personal details requested were gender and age, with age being grouped into three categories to further prevent identification. Moreover, no personally identifiable background information, like IP addresses or email addresses, was collected.

Translation

Since the study's population comprised Norwegian workers, all measurement tools required translation from their original languages into Norwegian. Using a back-translation method, the Norwegian version of the transient moods, the IWPQ (Koopmans et al., 2015), the CFSS (provided by the developer), and the CRT (Primi et al., 2016) were translated from their respective English versions. In this case, it was first translated from English to Norwegian by two bilingual individuals with Norwegian as their mother tongue. In the earlier mentioned pilot study, one key instruction given to participants was to provide feedback on the clarity and comprehensibility of the wording used in the translated materials. A different individual retranslated the Norwegian versions into English after minor adjustments to a few items were made based on the feedback. The original English versions exhibited no troubling discrepancies when compared with the back-translated English versions. The ODI had already been translated by academics proficient in English and Norwegian for a different project and was provided by the developer. In this process, they followed a classic back-translation procedure.

Data Analysis

Before conducting the main analyses, several steps were taken to prepare the data for analysis to ensure its quality and appropriateness for the statistical tests employed. Initially, the item related to positive mood in the transient mood measure was reverse-coded. Following this adjustment, the data was checked for missing data, uncommitted responses, and data distribution. Upon inspection for missing values, it was observed that the dataset was complete, with no instances of missing data. Further examination was conducted to identify uncommitted responses, such as straightlining. Straightlining is “the tendency of survey respondents to provide identical answers to consecutive questions.” (Reuning & Plutzer, 2020, p. 439). Variation was present in all respondents therefore none had to be removed. This examination was done with the dataset after those who had failed the attention-check item were removed.

A Shapiro-Wilk test was implemented to evaluate the data distribution of the main variables. This test was interpreted alongside histograms and Q-Q plots, and skewness and kurtosis values were considered (Field, 2018). Skewness measures the asymmetry of the data distribution. A positive skew indicates a longer tail extending to the right of the distribution, whereas a negative skew indicates a longer tail to the left. Kurtosis determines its peakedness or flatness (Field, 2018). The Shapiro-Wilk test, complemented by skewness and kurtosis values and visual examination of histograms and Q-Q plots, indicated that most of the variables conformed to a normal distribution. The ODI was the variable that deviated the most from normality (Skewness = 1.43, Kurtosis = 2.99).

The analyses were conducted using IBM SPSS Statistics version 28.0.1.0 (142) with a significance level of .05. To begin with, descriptive statistics were used to provide an overview of the sample characteristics, including means, frequencies, standard deviations, minimum, maximum, skewness, and kurtosis. This preliminary analysis offered insight into the general trends and patterns within the data. Cronbach’s α and McDonald’s ω were

computed to estimate the total-score reliability of task performance, contextual performance, CWB, CFSS, CRT, and ODI. Reliability scores around 0.8 were considered acceptable (Kline, 1999, as cited in Field, 2018, p. 823).

Correlational analysis was utilized to evaluate the strength and direction of the relationships between occupational depression, cognitive functioning, cognitive performance, and the three dimensions of work performance. Specifically, Spearman's correlation coefficient was chosen as the most suitable measure. This decision was made because the majority of the variables were measured at an ordinal level, and additionally, a few variables exhibited deviations from a normal distribution (Field, 2018)

Following the correlational analysis, hierarchical linear regression analysis was conducted. This method was selected for its ability to control for the influence of other variables. The regression analysis was structured in a two-step process, with each step introducing a different set of predictor variables. The first step incorporated age, sex, and transient moods as control variables. The main predictor, the ODI, was added in the second step. This two-step process was applied to the dependent variables: task performance, contextual performance, CWB, CFSS, and the CRT.

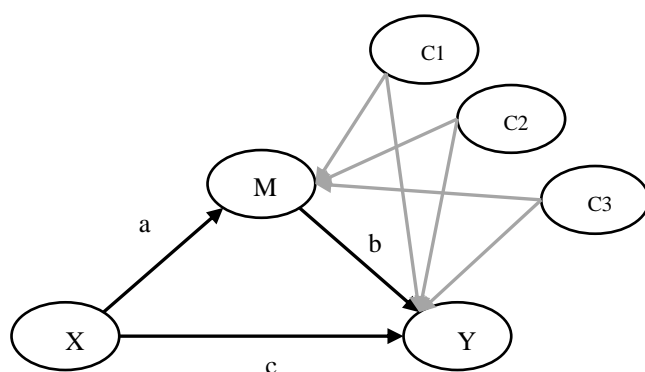
In order to compare CRT scores between groups with lower and higher levels of work-related depressive symptoms, I dichotomized the ODI mean scores based on a median split. This resulted in a cut-off value of 1.50. This led to a division into two groups: lower ODI scorers (mean ODI score < 1.50; coded as 0, $n = 80$) and higher ODI scorers (mean ODI score > 1.50; coded as 1, $n = 51$). An independent t-test was used to compare the two means.

Finally, a mediation analysis was performed to examine whether the relationship between ODI and task performance is mediated by individuals' perceived cognitive impairment. Mediation occurs when the relationship between a predictor variable and an outcome variable is explained through their connection with a third variable. When the

inclusion of a mediator reduces the relationship between the predictor and the outcome variable, this suggests that mediation has taken place (Field, 2018). The PROCESS tool/macro V4.2, developed by Andrew F. Hayes, was utilized to conduct the analysis (Hayes, 2022). Specifically, Model 4 was selected for executing a simple mediation analysis. Task performance was inserted as the outcome variable (Y), ODI was inserted as the independent variable (X), and CFSS was inserted as the mediator variable (M). Lastly, sex, age, and pretest mood were added as covariates (See Figure 1 for visualization).

Figure 1

Visualization of a Simple Mediation Model With Covariates



Results

Descriptive Statistics

Table 1 presents the descriptive statistics for the main variables of the study, encompassing all respondents. On average, the respondents scored lower than the midpoint on the ODI's rating scale ($M = 1.53$, skewness = 1.43), ranging from 1 to 4 in this study. This suggests that the sample, on the whole, reports minimal symptoms of job-related depression, indicating that this study involves a relatively healthy sample. Regarding work performance, the respondents, on average, scored above the midpoint for task performance ($M = 3.64$) and

around the midpoint for contextual performance ($M = 3.32$), and a little below the midpoint for CWB ($M = 2.32$). This indicates that, on average, the respondents often to frequently engage in behaviors associated with task and contextual performance, while seldom participating in counterproductive work behavior. In the CRT, participants, on average, correctly solved more than half of the questions, with a mean score of 0.58. Responses on the CFSS were, on average, below the midpoint ($M = 2.23$). This indicates a generally lower level of perceived cognitive impairment among the respondents.

Correlational Analyses

Concerning the relationship between the ODI and the dimensions of work performance and cognition, results from a two-tailed correlational analysis showed a significant negative correlation with task performance scores, $r_s(129) = -.39, p < .001$, and a significant positive correlation with CWB scores, $r_s(129) = .48, p < .001$. However, there was no significant correlation between the ODI scores and contextual performance scores, $r_s(129) = -.07, p = .462$. Regarding cognitive performance, ODI scores showed a non-significant negative correlation with CRT scores, $r_s(129) = -.07, p = .448$. Nevertheless, a significant positive correlation was found between ODI scores and perceived cognitive impairment as measured by CFSS, $r_s(129) = .43, p < .001$ (See Table 1).

Comparison between participants with higher ODI scores and lower ODI scores

An independent t-test revealed that there was no significant difference in CRT results between those with lower scores on the ODI, $M = 0.60, SD = 0.34$, and those with higher scores on the ODI, $M = 0.55, SD = 0.29, t(119.15) = 0.93, p = .356$.

Table 1*Descriptive Statistics and Spearman Correlations for Main Variables in the Study*

Variable	<i>M</i>	<i>SD</i>	Skew	Kurtosis	Min	Max	Median	1.	2.	3.	4.	5.	6.
1. TP	3.64	0.62	-0.11	0.01	2.00	5.00	3.60	-	.39***	-.32***	-.30***	-.20*	-.39***
2. CTXP	3.32	0.73	-0.8	-0.47	1.13	4.88	3.38		-	-.16	-.28***	-.18*	-.07
3. CWB	2.32	0.67	0.31	-0.12	1.00	4.20	2.20			-	.30***	.15	.48***
4. CFSS	2.23	0.43	0.52	0.73	1.33	3.67	2.22				-	-.09	.43***
5. CRT	0.58	0.32	-0.13	-1.32	0.00	1.00	0.67					-	-.07
6. ODI	1.53	0.48	1.43	2.99	1.00	3.78	1.44						-

Note. $N = 131$; TP = Task performance. CTXP = Contextual performance. CWB = Counterproductive work

behavior. CFSS = Cognitive functioning self-assessment scale. CRT = Cognitive reflection test. ODI = Occupational

Depression Inventory. *M* = Mean. *SD* = Standard Deviation

* $p < .05$, ** $p < .01$. *** $p < .001$

Hierarchical Linear Regression Analyses

The hierarchical linear regression analyses supported the significant relationships between the ODI and the aforementioned variables in the correlational analysis, controlling for sex, age, and pretest transient mood.

Task performance as the dependent variable

Step 1 included sex, age, and pretest transient mood as control variables. Step 1 was significant, $F(3, 127) = 3.89, p = .011$. This step accounted for 8.0% of the variance in task performance. With the inclusion of the ODI, the total variance explained by the model as a whole reached 16%, $R^2 = .16, \Delta R^2 = .08, F(1, 126) = 11.24, p = .001$. The ODI significantly predicted task performance, $\beta = -0.34, p = .001$. Table 2 displays the remaining coefficients and standard errors.

Table 2

Hierarchical Linear Regression Analysis for Prediction of Task Performance

Variable	<i>b</i>	<i>SE b</i>	β	R^2	ΔR^2
Step 1				.08*	
Sex ^a	-0.09	0.11	-0.07		
Age ^b	0.08	0.06	0.11		
Pretest mood	0.19	0.07	0.24**		
Step 2				.16**	.08**
Sex ^a	-0.04	0.10	-0.03		
Age ^b	0.08	0.06	0.11		
Pretest mood	0.03	0.08	0.04		
ODI	-0.44	0.13	-0.34**		

Note. $N = 131$; ODI = Occupational Depression Inventory. *SE b* = Standard error for the coefficient. Higher scores on the pretest mood indicate a more positive mood. Variance inflation factor values ranged from 1.02 to 1.54, indicating low levels of multicollinearity.

^a 0 = Male, 1 = Female. ^b 1 = 18-34, 2 = 35-49, 3 = 50+

* $p < .05$, ** $p < .01$. *** $p < .001$

Contextual Performance as Dependent Variable

Step 1 was insignificant, $F(3, 127) = 1.26, p = .291$. This step accounted for 3.0% of the variance in contextual performance. With the inclusion of the ODI score in step 2, there was no significant increase in the variance explained, $\Delta R^2 = .02, F(1, 126) = 2.17, p = .143$. Table 3 displays the remaining coefficients and standard errors.

Table 3

Hierarchical Linear Regression Analysis for Prediction of Contextual Performance

Variable	<i>b</i>	<i>SE b</i>	β	R^2	ΔR^2
Step 1				.03	
Sex ^a	-0.10	0.13	-0.07		
Age ^b	0.09	0.08	0.10		
Pretest mood	0.09	0.08	0.10		
Step 2				.05	.02
Sex ^a	-0.13	0.13	-0.09		
Age ^b	0.09	0.08	0.10		
Pretest mood	0.18	0.10	0.19		
ODI	0.24	0.17	0.16		

Note. $N = 131$; ODI = Occupational depression inventory. *SE b* = Standard error for the coefficient. Higher scores on the pretest mood indicate a more positive mood. Variance inflation factor values ranged from 1.02 to 1.54, indicating low levels of multicollinearity.

^a 0 = Male, 1 = Female. ^b 1 = 18-34, 2 = 35-49, 3 = 50+

Counterproductive Work Behavior as Dependent Variable

Step 1 was significant, $F(3, 127) = 15.63, p < .001$. This step accounted for 27.0% of the variance in CWB. With the inclusion of the ODI, the total variance explained by the model as a whole increased to 34.0%, $\Delta R^2 = .07, F(1, 126) = 12.35, p < .001$. The ODI was a

significant predictor of CWB, $\beta = 0.32$, $p < .001$. Table 4 displays the remaining coefficients and standard errors.

Table 4

Hierarchical Regression Analysis for Prediction of Counter Productive Work Behavior

Variable	<i>b</i>	<i>SE b</i>	β	R^2	ΔR^2
Step 1				.27***	
Sex ^a	0.22	0.10	0.16*		
Age ^b	-0.16	0.06	-0.20*		
Pretest mood	-0.35	0.07	-0.40***		
Step 2				.34***	.07***
Sex ^a	0.17	0.10	0.13		
Age ^b	-0.16	0.06	-0.20**		
Pretest mood	-0.19	0.08	-0.22*		
ODI	0.44	0.13	0.32***		

Note. $N = 131$ ODI = Occupational Depression Inventory. *SE b* = Standard error for the coefficient. Higher scores on the pretest mood indicate a more positive mood. Variance inflation factor values ranged from 1.02 to 1.54, indicating low levels of multicollinearity.

^a 0 = Male, 1 = Female. ^b 1 = 18-34, 2 = 35-49, 3 = 50+

* $p < .05$, ** $p < .01$. *** $p < .001$

Perceived Cognitive Impairment as Dependent Variable

Step 1 was significant, $F(3, 127) = 5.55$, $p = .001$. This step accounted for 12.0% of the variance in CFSS scores. With the inclusion of the ODI, the total variance explained by the model as a whole increased to 18.0%, $\Delta R^2 = .06$, $F(1, 126) = 9.24$, $p = .003$. The ODI significantly predicted perceived cognitive impairment, $\beta = 0.31$, $p = .003$. Table 5 displays the remaining coefficients and standard errors.

Table 5*Hierarchical Linear Regression Analysis for Prediction of Perceived Cognitive Impairment*

Variable	<i>b</i>	<i>SE b</i>	β	R^2	ΔR^2
Step 1				.12**	
Sex ^a	0.13	0.07	0.15		
Age ^b	0.01	0.04	0.02		
Pretest mood	-0.17	0.05	-0.30***		
Step 2				.18**	.06**
Sex ^a	0.10	0.07	0.12		
Age ^b	0.01	0.04	0.02		
Pretest mood	-0.07	0.06	-0.13		
ODI	0.28	0.10	0.31**		

Note. $N = 131$; ODI = Occupational Depression Inventory. *SE b* = Standard error for the coefficient. Higher scores on the pretest mood indicate a more positive mood. Variance inflation factor values ranged from 1.02 to 1.54, indicating low levels of multicollinearity.

^a 0 = Male, 1 = Female. ^b 1 = 18-34, 2 = 35-49, 3 = 50+

* $p < .05$, ** $p < .01$. *** $p < .001$

Cognitive Reflection Test Scores as Dependent Variable

Step 1 was significant, $F(3, 127) = 3.21, p = .025$. This step accounted for 7.0% of the variance in CRT scores. With the inclusion of the ODI score in step 2, there was no significant increase in the variance explained, $\Delta R^2 = .01, F(1, 126) = 1.67, p = .198$. Table 6 displays the remaining coefficients and standard errors.

Table 6*Hierarchical Linear Regression Analysis for Prediction of Cognitive Performance*

Variable	<i>b</i>	<i>SE b</i>	β	R^2	ΔR^2
Step 1				.07*	
Sex ^a	-0.07	0.06	-0.11		
Age ^b	-0.10	0.03	-0.26**		
Pretest mood	0.01	0.04	0.01		
Step 2				.08	.01
Sex ^a	-0.06	0.06	-0.10		
Age ^b	-0.10	0.03	-0.26**		
Pretest mood	-0.03	0.04	-0.07		
ODI	-0.09	0.07	-0.14		

Note. $N = 131$; ODI = Occupational Depression Inventory. *SE b* = Standard error for the coefficient. Higher scores on the pretest mood indicate a more positive mood. Variance inflation factor values ranged from 1.02 to 1.54, indicating low levels of multicollinearity.

^a 0 = Male, 1 = Female. ^b 1 = 18-34, 2 = 35-49, 3 = 50+

* $p < .05$, ** $p < .01$. *** $p < .001$

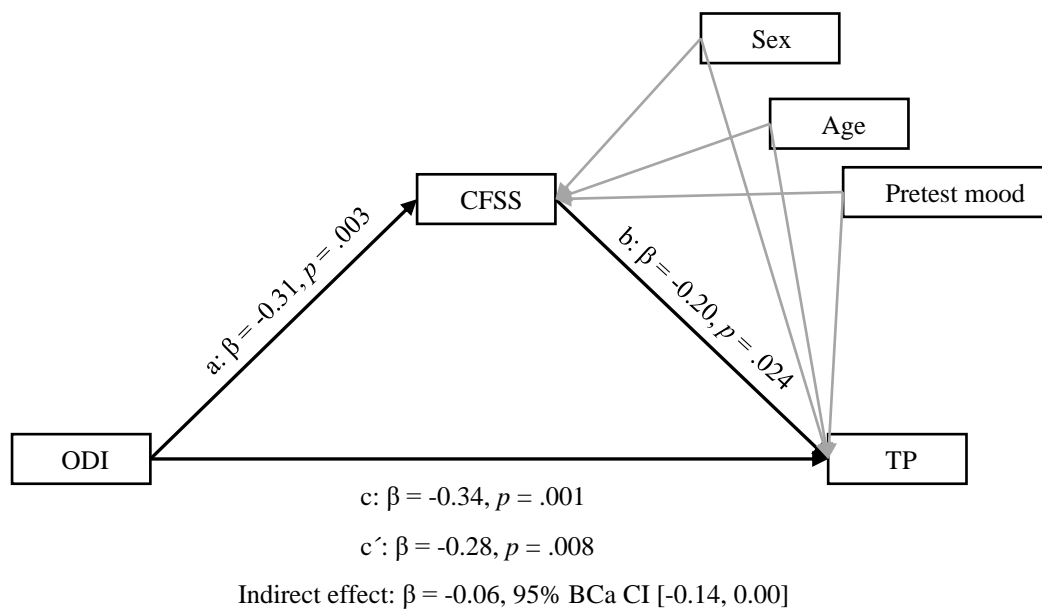
Mediation

The mediation analysis, conducted using the PROCESS tool (Model 4), examined the indirect effect of occupational depression (independent variable) on task performance (dependent variable) through perceived cognitive impairment (mediator) while controlling for the variables sex, age, and pretest mood. The analysis revealed a significant total effect of ODI on task performance (path c), $\beta = -0.34$, $p = .001$. Both the path from ODI to CFSS (path a), $\beta = -0.31$, $p = .003$, and the path from CFSS to task performance (path b), $\beta = -0.20$, $p = .024$, were significant. When CFSS scores entered the relationship between ODI and task performance, the direct effect (c' path), $\beta = -0.28$, $p = .008$, was significant. There was no significant effect of occupational depression on task performance through perceived cognitive impairment, $\beta = -0.06$, 95% BCa CI [-0.14, 0.00]. Since the confidence intervals include zero,

it indicates that perceived cognitive impairment does not mediate the relationship between ODI and task performance (See Figure 2 for visualization of the result).

Figure 2

Indirect Effect of ODI on Task Performance Through Perceived Cognitive Impairment While Controlling for Sex, Age, and Pretest Mood.



Note. $N = 131$; ODI = Occupational Depression Inventory. CFSS = Cognitive Functioning Self-Assessment Scale. TP = Task Performance. c' = Direct Effect

Discussion

I examined whether and how work-attributed depressive symptoms influence cognition and work performance in a sample of Norwegian workers. The results revealed no significant relationship between occupational depression and objective cognitive performance. Additionally, comparisons of CRT scores revealed no significant differences

between individuals with fewer work-attributed depressive symptoms and those with a higher level of such symptoms. H1 and H2 thus received no support. H3, by contrast, was supported. I found a positive relationship between work-attributed depressive symptoms and perceived cognitive impairment. Concerning the three dimensions of work performance, the findings supported H4, which posited a negative relationship between occupational depression and task performance, and H6, which predicted a positive relationship between occupational depression and CWB. However, no support was found for H5, meaning that there is no significant relationship between occupational depression and contextual performance. Lastly, H7, proposing that the effect of work-attributed depressive symptoms on task performance is mediated by perceived cognitive impairment, was not supported.

Occupational Depression and Objective Cognitive Performance

The study's first hypothesis, which posited a negative relationship between the ODI and cognitive performance, was not supported. The same applied to the second hypothesis, which concerned group differences in CRT scores between individuals with fewer versus more work-attributed depressive symptoms. The findings of this study contrast with a substantial body of research done on depression, indicating that higher levels of depressive symptoms are related to reduced objective cognitive performance (Ahern & Semkovska, 2017; McIntyre et al., 2013; Rock et al., 2014; Semkovska et al., 2019; Snyder, 2013). Additionally, they do not align with studies explicitly focusing on work-attributed depressive symptoms, which have demonstrated a negative relationship to objective cognitive performance (Bianchi et al., 2022a; Bianchi & Schonfeld, 2021, 2022).

A possible explanation for the contrasting results with depression research is the distinct characteristics of this study's sample and how these contrast with those used in previous studies (e.g., Ahern & Semkovska, 2017; Rock et al., 2014; Snyder, 2013). Unlike much of the existing research on depression and cognitive performance, which predominantly

utilized clinical samples, this study involved a non-clinical sample. A clinical sample will likely include individuals with more pronounced depressive symptoms, which might more evidently impact cognitive performance. Approaching depression from a dimensional perspective, where symptoms vary in severity along a continuum with a depressive disorder at the more severe end (Haslam et al., 2012; Wichers, 2014), this study's sample appears to be situated toward the milder side of this spectrum. This is evidenced by the lower mean scores on the ODI, indicating that the participants primarily experienced milder work-attributed depressive symptoms. Consequently, this sample may not demonstrate the degree of cognitive impairment typically observed in clinical populations.

However, this explanation cannot explain why this study's findings diverge from those obtained with other non-clinical samples. Notably, where other studies have identified a negative relationship between the ODI and objective cognitive performance (Bianchi et al., 2022a; Bianchi & Schonfeld, 2021, 2022), the current study did not. Interestingly, this study and other research in the field reported comparable effect sizes concerning the relationship between occupational depression and cognitive performance (e.g., Bianchi & Schonfeld, 2021). A plausible explanation for this may lie in the difference in sample sizes. With its relatively small sample size, this study may not have had sufficient statistical power to detect small relationships as statistically significant. This is particularly relevant in the context of effect sizes. While the effect sizes in this study were close to those found in other research, the power to confidently assert these effects is impacted by the number of participants. Larger samples tend to provide more reliable estimates and increase the likelihood of detecting true effects, even if the effects are small (Faber & Fonseca, 2014).

The general healthiness of the participants in this study might account for the lack of significant differences in CRT scores between symptom groups, especially when compared to other research on occupational depression and objective cognitive performance, such as the

studies by Bianchi and Schonfeld (2021, 2022). The healthiness of my study sample was well illustrated by the fact that only one participant met the criteria for a provisional diagnosis of occupational depression. The impact on cognitive performance may not be as prominent as seen in populations experiencing higher levels of work-related depressive symptoms. In this study sample, the depressive symptoms may not have manifested themselves to a degree that would have affected cognitive performance, thus showing no changes in this domain. This is evident compared to the studies mentioned above, where individuals with more symptoms, indicated by higher mean scores, exhibited a more deteriorated cognitive performance.

The present study suggests that with milder levels of occupational depression, there may not be a noticeable decline in cognitive abilities, at least as detectable in tests like the CRT. These findings suggest that the impact of occupational depression may vary based on the severity of the symptoms. Research involving clinical samples may support this notion, as studies have demonstrated that the alleviation of symptoms, such as during a state of remission, is associated with improved cognitive abilities compared to when going through a depressive episode (Ahern & Semkovska, 2017; Lam et al., 2014; Rock et al., 2014).

Occupational Depression and Perceived Cognitive Functioning

In support of H3, the study revealed a significant positive relationship between occupational depression and perceived cognitive impairment. This outcome is particularly noteworthy as it contrasts with the absence of measurable declines in objective cognitive performance among the respondents. Despite this, individuals with higher levels of work-attributed depressive symptoms reported a notable impact on their self-perceived cognitive abilities. The results of this study align with research that has investigated both subjective and objective cognitive measurements (Dhillon et al., 2020; Lahr et al., 2007; Mowla et al., 2008; Schweizer et al., 2018; Svendsen et al., 2012).

In their study with a non-clinical sample, Dhillon et al. (2020) compared objective and subjective cognitive impairments in the context of depressive symptoms. Their result indicated that perceived cognitive impairments account for significant incremental variance in depressive symptoms beyond neuropsychological test scores. This implies that individuals with depressive symptoms are more inclined to report and subjectively experience cognitive impairments, even in the absence of objectively measured deficits (Dhillon et al., 2020). This aligns with the patterns observed in the present study. Strengthening the idea that the subjective experience of cognitive impairment in depressive states can be profound, even when objective cognitive performance remains unaffected. Lahr et al. (2007) observed similar findings within a clinical sample.

A plausible explanation for this is that depression can involve distorted thinking, which leads to negative thoughts (Gotlib & Joormann, 2010). Furthermore, these distorted thinking patterns may also contribute to individuals endorsing symptoms of cognitive impairment, reflecting an inaccurate appraisal of their own abilities (Beck, 1963). Such misjudgments typically arise from the negative self-beliefs characteristic of depressive thought processes. In the context of the present study, this suggests that individuals with higher levels of work-attributed depressive symptoms may have a negatively biased self-perception, potentially leading them to overestimate their cognitive deficits. These deficits may not be severe enough to manifest themselves in objectively measured cognitive performance. This could also explain the lack of support for H1 and H2, highlighting the complex interplay between depressive symptoms and cognitive function.

Occupational Depression and Task Performance

An extensive body of research has looked at the relationship between depression and task performance (Beck et al., 2011; Gagan et al., 2013; Harvey et al., 2011; Johnston et al., 2019; Lerner & Henke, 2008; Stander et al., 2016; Woo et al., 2011). Results from the current

study support the hypothesis that there is a negative relationship between occupational depression and task performance, consistent with research done on both clinical samples, e.g. (Adler et al., 2006; Woo et al., 2011) and non-clinical samples (e.g., Johnston et al., 2019). This finding is significant even in the context of the study's generally healthy sample, aligning with prior research done on general depression, which indicates that sub-clinical levels of depression are linked with reduced task performance (Beck et al., 2011; Gagan et al., 2013; Johnston et al., 2019).

Considering the subjective nature of the measurement tool used in this study is crucial when interpreting the findings. The assessment of task performance was based on self-reported data, thereby capturing the respondents' own perceptions and experiences. While such subjective measures provide valuable insights into individuals' internal states and personal experiences, they might not always align with objective evaluations. Similar to the assessment of cognitive functioning, individuals with heightened work-attributed depressive symptoms may possess a negatively biased self-perception, leading them to believe their performance is worse than it actually is. Nonetheless, research conducted by Harvey et al. (2011) with employees from a telecommunications company demonstrated a negative linear relationship between rates of depressive symptoms and objective measures of task performance, suggesting that depressive symptoms can indeed have a tangible impact on actual work performance. Therefore, while subjective assessments offer important perspectives on how individuals perceive their task performance in the context of occupational depression, incorporating objective measures is vital for a more comprehensive understanding of the true impact of depressive symptoms on task performance.

Occupational Depression and Contextual Performance

Contextual performance refers to behaviors that contribute to a workplace's organizational, social, and psychological environment, such as undertaking additional tasks,

showing initiative, proactivity, or leading and developing others (Koopmans et al., 2011). The results from the current study showed no support for H5, indicating no relationship between occupational depression and contextual performance. The lack of support for the hypothesis in this study contrasts with the findings from other research (Ford et al., 2011; Jeong & Lee, 2022; Singh & Bhuvaneswari, 2023). Interestingly, the research above has shown varied results, suggesting that the relationship between depressive symptoms and contextual performance may be more complex than initially anticipated.

The tools and criteria used to assess contextual performance in this study may differ from those employed in past research. For instance, the measurement of contextual performance in the study by Singh and Bhuvaneswari (2023) included a broader range of items, explicitly emphasizing helping and assisting coworkers. Additionally, their study was conducted in India. Asian countries are often characterized by more collectivistic cultural values compared to Western countries (Lui & Rollock, 2018). This cultural context may help explain the positive relationship they observed between depression and contextual performance. As a result, participants might naturally score higher on measures of helping and assisting coworkers, regardless of their levels of depressive symptoms, due to the cultural emphasis on collective well-being. In contrast, Jeong and Lee (2022) found a negative relationship in their study of South Korean service workers, which also considered the impact of customer mistreatment. This discrepancy could be attributed to methodological differences, as Singh and Bhuvaneswari (2023) used a sample of employees from an automobile components manufacturing organization. The distinct nature of these industries and job roles may significantly influence how depression impacts contextual performance.

All in all, an explanation for the current study's findings may relate to the specific measures used and the Western context in which the study was conducted. More specifically, the measurement of contextual performance in this study had a particular emphasis on

behaviors relating to taking on extra work and responsibilities. This may highlight a cultural difference, as individuals in Western cultures may generally be less inclined to take on additional tasks or responsibilities for the greater good of the organization (Hofstede & Bond, 1984). Consequently, other factors beyond occupational depression may influence engagement in such behaviors, potentially explaining why no significant effects were observed on contextual performance in this study. However, this result contrasts with those from the meta-analysis by Ford et al. (2011), which included predominantly U.S.-based studies and demonstrated a generally negative relationship between depression and contextual performance. Their study encompassed a diverse range of performance variables such as extra-role behavior, citizenship behavior, taking on leadership roles not specified in an individual's job description, giving extra effort, and demonstrating altruism and conscientiousness. This comprehensive approach to measuring contextual performance could capture more facets of workplace behavior affected by depression than the narrower focus used in our study, potentially accounting for the diverse findings.

Occupational Depression and CWB

No research has been done on the relationship between occupational depression and CWB, and limited research has been done on general depression and CWB. The result from this study supports H6, which posited a positive relationship between occupational depression and CWB. This relationship suggests that as individuals experience greater levels of depressive symptoms attributed to their work, they are more likely to engage in behaviors that harm the well-being of the organization. This finding does not align with research done by Singh and Bhuvaneshwari (2023), who found no relationship between the two variables. On the other hand, the positive relationship found in the current study aligns with research indicating that negative affectivity, often linked with depression, correlates positively with CWB (Dalal, 2005; Dalal et al., 2012; Penney & Spector, 2005; Spector & Fox, 2002). These

findings suggest that depressive emotions can overflow into workplace behaviors, leading individuals to engage in actions that may conflict with organizational goals.

The workplace is an environment where individuals monitor situations that may impact their well-being. Situations perceived as threats to their well-being, such as increased workloads or tight deadlines, are likely to provoke negative emotions. This emotional response can, in turn, influence workplace behavior as employees react to perceived stressors. A situation that triggers a negative emotion may lead an individual to either actively and directly confront the situation (e.g., by speaking negatively about work or coworkers) or to cope with the emotion in a passive and indirect manner (e.g., by avoiding work) (Spector & Fox, 2002). An imbalance between positive, rewarding experiences and negative, punitive experiences can lead to depressive symptoms (Bianchi & Schonfeld, 2020). Elevated levels of work-related depressive symptoms may thus act as a catalyst for behaviors that do not align with organizational goals, potentially leading to increased instances of CWB.

Furthermore, research has consistently shown that there is a relationship between depression and job satisfaction. Individuals with depression, including those experiencing occupational depression, often report lower levels of job satisfaction (Bianchi & Schonfeld, 2020; Capone & Petrillo, 2020; Ferguson et al., 2012; Zhang & Chai, 2020). This decline in job satisfaction among individuals with depression can be attributed to several factors. Depression often leads to decreased motivation and energy (Smith, 2013) and a sense of helplessness (Pryce et al., 2011). Consequently, this can impact the individual's engagement and satisfaction with their work, potentially leading to elevated negativity about their job and an exaggeration of workplace problems. Moreover, research exploring the relationship between job satisfaction and CWB has consistently found that individuals who are less satisfied with their jobs are more likely to engage in CWB (Dalal, 2005; Mount et al., 2006; Penney & Spector, 2005). Thus, a plausible explanation for the current finding is that

individuals with elevated levels of depressive symptoms tend to be less satisfied with their jobs and, therefore, are more inclined to engage in CWB.

Occupational Depression, Task Performance, and Perceived Cognitive Impairment

The last hypothesis proposed that perceived cognitive impairment would serve as a mediator in the relationship between occupational depression and task performance. This hypothesis was based on the premise that cognitive impairments associated with depression might be the mechanism by which depression impacts an individual's ability to perform work tasks effectively (Lam et al., 2014). The findings from this study did not support this mediation hypothesis. No significant mediating effect of perceived cognitive impairment was observed, indicating that while work-attributed depressive symptoms and perceived cognitive impairments negatively impact task performance, they may do so independently in this context. This result does not align with previous research, which has often found that cognitive impairments mediate the effects of depression on various forms of functional outcomes (Buist-Bouwman et al., 2008; McIntyre et al., 2013; McIntyre et al., 2015; Woo et al., 2016).

One possible explanation is that the level of depressive symptoms experienced by participants can vary widely. Studies involving clinical populations with severe depression might find more robust relationships between depression, cognitive impairment, and task performance compared to studies with non-clinical populations or those with milder depressive symptoms, like the current study. This variability in symptom severity can lead to different impacts on cognitive functions and, consequently, on task performance. For example, individuals with MDD, as in the McIntyre et al. (2015) study, may demonstrate more pronounced cognitive deficits, which could directly affect their ability to perform tasks effectively. In contrast, participants in the present study represent a generally healthier

sample. The milder symptoms observed in such groups may not disrupt cognitive functions enough to produce a noticeable mediation effect on task performance.

Another explanation for the present finding is that cognitive deficits might impact occupational functioning differently, depending on the individual and their job role. This variability means that the same level of cognitive deficit might significantly hinder performance in a role that may be more sensitive to cognitive deficits, such as lawyers or technical professions. It may show less effect in professions with less cognitive demands (Evans et al., 2013). Consequently, the relationship between cognitive impairments and task performance might not be uniformly observable across all occupations. Also, variations in how task performance is measured could account for discrepancies in findings. For example, Buist-Bouwman et al. (2008) used an assessment that included role function both at home and in paid employment, which might capture a broader spectrum of performance impacts compared to the present study, which focused solely on performance in a work setting. The lack of significant mediation by perceived cognitive impairment in the present study's findings emphasizes the nuanced interplay between occupational depression and task performance in the workplace. This calls for more detailed investigations into how different factors, including the severity of symptoms and occupational roles, might influence these relationships.

Limitations

There are some noteworthy limitations to the present study. The first limitation is the relatively small study sample ($N = 131$). Sample size impacts the statistical power, limiting the ability to detect smaller effects (Faber & Fonseca, 2014). Additionally, the participants in this study were recruited through convenience and snowball sampling methods. This approach limits the generalizability of the findings, as it primarily includes individuals who are readily accessible to the researcher and may not represent the wider population (Meltzoff & Cooper,

2018). Given this sampling method and the small sample size, the ability to generalize the findings across different contexts is constrained.

Second, although the CRT offers valuable insights into general cognitive ability (Primi et al., 2016), employing a more comprehensive battery of cognitive tests would have provided an advantage by delivering more detailed findings. A broader range of cognitive assessments could have captured a wider spectrum of cognitive functions. This would have allowed for a more nuanced understanding of how occupational depression impacts different cognitive domains. Additionally, it was initially intended to impose a time limit on the CRT items. However, due to limitations with the survey platform, implementing a time constraint was not feasible. The absence of a time limit likely rendered the CRT easier to complete and less sensitive to minor alterations in cognitive functions.

Third, the study relied heavily on self-reported measures. This approach inherently introduces a level of subjectivity, which can lead to response biases and potentially inaccurate results. This is highly relevant since depression can involve distorted thinking, which leads to negative thoughts (Gotlib & Joormann, 2010). Participants may have provided negatively biased responses about their personal mental health and workplace behaviors. Such factors must be carefully considered when interpreting the findings.

As a final point, while not necessarily a limitation of the study itself, it is important to note that research on occupational depression is less extensive compared to research on clinical depression. Consequently, much of the comparative analysis relies on findings from clinical groups. The variability in symptom presentation, severity, and impacts on daily functioning between these groups necessitates cautious interpretation. Further research explicitly targeting occupational depression is needed to develop a more nuanced understanding of its unique characteristics and effects.

Practical Implications

The findings of this study have implications for workplace practices, particularly in the areas of employee wellness and performance management. By highlighting the impact of occupational depression on work performance and perceived cognitive impairment, this research provides valuable insights for developing more effective strategies to support employee mental health and enhance organizational productivity. These insights are vital for organizations aiming to implement targeted interventions that address the specific challenges posed by occupational depression.

This research also sheds light on an intriguing aspect of occupational depression and its impact on cognition. While occupational depression was shown to have a significant impact on perceived cognitive impairment, it did not have an impact on cognitive performance. It suggests that while employees with job-related depressive symptoms may feel that their cognitive abilities are declining, standard objective tests might not always capture this perceived decline. This discrepancy underscores the need for workplace interventions that address not only the measurable aspects of objective cognitive functioning but also the subjective experiences of employees, which can be equally critical in managing overall work performance and employee satisfaction.

Future Research

This study has laid the groundwork for several promising directions for future research. Given the findings and limitations of the current research, further investigation is needed to deepen our understanding of occupational depression.

First, this study utilized a cross-sectional design. Adopting a longitudinal approach in future research could shed light on the causal relationships and temporal dynamics between occupational depression and work-related outcomes. Regarding the longitudinal approach, intervention studies would also be interesting for future research. Intervention studies are crucial for testing the effectiveness of strategies designed to mitigate the impacts of

occupational depression on work performance and cognition. By implementing and evaluating targeted interventions, researchers can provide empirical evidence on which approaches are most effective in improving individual well-being and organizational outcomes.

Second, future research should incorporate more objective work performance assessments alongside a comprehensive battery of objective cognitive tests. This approach would provide a clearer view of how occupational depression impacts work-related functions. Objective performance metrics, such as productivity data or quality evaluations conducted by independent assessors, can help validate self-reported data and offer a more rounded perspective. Similarly, utilizing detailed neuropsychological assessments would allow for a more precise measurement of cognitive functions potentially affected by occupational depression, enabling a deeper understanding of the interplay between cognitive abilities and job performance.

Conclusion

This study aimed to better understand the relationship between occupational depression, cognition, and work performance in a Norwegian sample. The results indicated that higher levels of work-attributed depressive symptoms were associated with poorer task performance, increased engagement in CWB, and greater perceived cognitive impairment. However, the study did not find significant evidence of a relationship between occupational depression and either objective cognitive performance or contextual performance. Additionally, the study found no evidence supporting perceived cognitive impairment as a mediator between occupational depression and task performance. This research highlights the critical impact of occupational depression on various aspects of workplace functioning and subjective cognitive complaints, underscoring the importance of addressing mental health in occupational settings. Furthermore, the lack of significant findings linking occupational

depression with objective cognitive performance and contextual performance suggests that the manifestation of depression-related impairments may be more complex and varied than sometimes assumed. Given that occupational depression is a relatively newly recognized phenomenon, further research is essential to help organizations develop effective interventions and strategies to address it.

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Appendix

Appendix A: Approval from Sikt for the processing of personal data



Vurdering av behandling av personopplysninger

Referansenummer
 970566

Vurderingstype
 Automatisk

Dato
 09.03.2024

Tittel
Occupational depression in the Norwegian workforce: How does it impact cognition and work performance

Behandlingsansvarlig institusjon
Norges teknisk-naturvitenskapelige universitet / Fakultet for samfunns- og utdanningsvitenskap (SU) / Institutt for psykologi

Prosjektansvarlig
Renzo Bianchi

Student
Håkon Frogner Skår

Prosjektperiode
01.10.2023 - 02.05.2024

Kategorier personopplysninger
Alminnelige

Lovlig grunnlag
Samtykke (Personvernforordningen art. 6 nr. 1 bokstav a)

Behandlingen av personopplysningene er lovlig så fremt den gjennomføres som oppgitt i meldeskjemaet. Det lovlige grunnlaget gjelder til 02.05.2024.

[Meldeskjema](#)

Grunnlag for automatisk vurdering

Meldeskjemaet har fått en automatisk vurdering. Det vil si at vurderingen er foretatt maskinelt, basert på informasjonen som er fylt inn i meldeskjemaet. Kun behandling av personopplysninger med lav personvernulempe og risiko får automatisk vurdering. Sentrale kriterier er:

- De registrerte er over 15 år
- Behandlingen omfatter ikke særlige kategorier personopplysninger;
 - Rasemessig eller etnisk opprinnelse
 - Politisk, religiøs eller filosofisk overbevisning
 - Fagforeningsmedlemskap
 - Genetiske data
 - Biometriske data for å entydig identifisere et individ
 - Helseopplysninger
 - Seksuelle forhold eller seksuell orientering
- Behandlingen omfatter ikke opplysninger om straffedømmer og lovovertrедelser
- Personopplysningene skal ikke behandles utenfor EU/EØS-området, og ingen som befinner seg utenfor EU/EØS skal ha tilgang til personopplysningene
- De registrerte mottar informasjon på forhånd om behandlingen av personopplysningene.

Informasjon til de registrerte (utvalgene) om behandlingen må inneholde

- Den behandlingsansvarliges identitet og kontaktopplysninger
- Kontaktopplysninger til personvernombudet (hvis relevant)
- Formålet med behandlingen av personopplysningene
- Det vitenskapelige formålet (formålet med studien)
- Det lovlige grunnlaget for behandlingen av personopplysningene
- Hvilke personopplysninger som vil bli behandlet, og hvordan de samles inn, eller hvor de hentes fra
- Hvem som vil få tilgang til personopplysningene (kategorier mottakere)
- Hvor lenge personopplysningene vil bli behandlet
- Retten til å trekke samtykket tilbake og øvrige rettigheter

Vi anbefaler å bruke vår [mal til informasjonsskriv](#).

Informasjonssikkerhet

Du må behandle personopplysningene i tråd med retningslinjene for informasjonssikkerhet og lagringsguider ved behandlingsansvarlig institusjon. Institusjonen er ansvarlig for at vilkårene for personvernforordningen artikkel 5.1. d) riktighet, 5. 1. f) integritet og konfidensialitet, og 32 sikkerhet er oppfylt.

Appendix B: The questionnaire in Norwegian

Page 1:

Spørreundersøkelse om arbeidshelse og kognisjon

Velkommen til denne spørreundersøkelsen om arbeidshelse og kognisjon. Din deltakelse i denne studien er svært verdsatt.

Deltakelse i denne undersøkelsen er helt frivillig. Du har rett til å velge om du vil delta eller ikke, og du kan trekke deg når som helst underveis uten problemer hvis du føler deg ukomfortabel med noen av spørsmålene. Undersøkelsen er hovedsakelig rettet mot arbeidshelse, og dine tanker og erfaringer knyttet til jobb-relatert stress, men det vil også være spørsmål knyttet til atferd og kognisjon. Din deltakelse bidrar til mer kunnskap om dette viktige området. Vi setter pris på din innsats for å støtte forskning på dette feltet.

Det vil ikke registreres noen personidentifiserende opplysninger ved utfylling, heller ikke IP-adresser ved utfylling. Du er derfor som deltaker sikret full anonymitet. Det tar 10-15 minutter å besvare undersøkelsen. Funn fra studien vil bli presentert i artikkelform og som en egen rapport.

Denne undersøkelsen gjennomføres utelukkende for forskningsformål. Data samles av masterstudent i arbeids- og organisasjonspsykologi Håkon Frogner Skår under veiledning av førsteamanuensis Renzo Bianchi ved institutt for psykologi, NTNU.

Vi takker deg for at du tar deg tid til å delta. Vennligst fortsett med undersøkelsen og svar på hvert spørsmål så godt du kan. Hvis du har bekymringer eller spørsmål, er du velkommen til å kontakte Håkon på mail: Haakonfs@stud.ntnu.no

Page 1:

- 1. Jeg har lest og forstått informasjonen om undersøkelsen og gir herved mitt samtykke til at mine svar kan benyttes i publisering av funn fra studien. Alle svar forblir anonyme**

- ☐ Ja
- ☐ Nei

Page 2:**2. Kjønn**

- ☐ Mann
- ☐ Kvinne
- ☐ Annet

3. Hvor gammel er du?

- ☐ 18-34
- ☐ 35-49
- ☐ 50+

4. Hva er din nåværende arbeidsstatus

- ☐ Fulltidsansatt
- ☐ Deltidsansatt

Page 3:**5. Hvordan føler du deg idag?**

	Veldig enig	Enig	Verken enig eller uenig	Uenig	Veldig uenig
Jeg føler meg bra/jeg er i godt humør.					

Jeg føler meg nedstemt/demoralisert.					
Jeg føler meg sint/irritert.					

Page 4:

- 6. Nedenfor vil du finne noen utsagn som omhandler bestemt atferd knyttet til en arbeidskontekst. Vennligst vurder hvor ofte du har utvist denne typen atferd i løpet av de siste TRE MÅNEDENE i en arbeidssammenheng.**

Jeg klarte å planlegge arbeidet mitt slik at jeg fullførte det i tide.	Sjeldent	Noen ganger	Ofte	Hyppig	Alltid
Jeg hadde i tankene det arbeidsresultatet jeg trengte å oppnå.					
Jeg klarte å sette prioriteringer.					
Jeg klarte å utføre arbeidet mitt effektivt.					
Jeg håndterte tiden min godt.					
På eget initiativ startet jeg nye oppgaver når mine gamle oppgaver var fullført.					
Jeg påtok meg utfordrende oppgaver når de var tilgjengelige.					
Jeg jobbet med å holde min jobbrelaterte kunnskap oppdatert.					
Jeg jobbet med å holde mine arbeidsferdigheter oppdaterte.					

Jeg kom opp med kreative løsninger for nye problemer.					
Jeg påtok meg ekstra ansvar.					
Jeg søkte kontinuerlig etter nye utfordringer i arbeidet mitt.					
Jeg deltok aktivt i møter og/eller konsultasjoner.					

Vær oppmerksomhet på at svaralternativene nå er endret.

	Aldri	Sjeldent	Noen ganger	Ofte	Hyppig
Jeg klagde på mindre arbeidsrelaterte problemer på jobb.					
Jeg gjorde problemer på jobb større enn de egentlig var.					
Jeg fokuserte på de negative sidene av situasjonen på jobb i stedet for de positive sidene.					
Jeg snakket med kollegaer om de negative sidene ved jobben min.					
Jeg snakket med personer utenfor organisasjonen om de negative sidene ved jobben min.					

Page 5:

- 7. Under følger en liste med utsagn. Vennligst les hvert utsagn, og velg det svaret som virker mest passende for deg i ditt hverdagslige liv. Når du besvarer, ta utgangspunkt i de siste 12 MÅNEDENE.**

	Aldri	Nesten aldri	Noen ganger	Nesten alltid	Alltid
Jeg synes det er vanskelig å konsentrere meg.					
Jeg blir lett fraværende mentalt.					
Jeg synes det er vanskelig å gjøre to ting samtidig, selv enkle ting (eks: når jeg snakker i telefonen mens jeg går, kan det hende at jeg går feil vei eller må avslutte samtalen for å finne riktig vei).					
Jeg synes det er vanskelig å gjøre mentale beregninger (eks: kan ikke regne ut totalsummen mentalt når jeg handler).					
Ord er på tuppen av tungen min (Jeg har ordene klare, men de sitter fast).					
Jeg blir fraværende mentalt midt i en aktivitet.					

Jeg synes det er vanskelig å organisere ekstra rutineaktiviteter (eks: middag med flere mennesker).					
Jeg synes det er vanskelig å huske nylig informasjon (eks: navnet på en person, navnet på et sted eller navnet på et produkt).					
Jeg synes det er vanskelig å huske informasjon jeg en gang kjente godt (eks: datoer for historiske hendelser, geografiske steder).					
Jeg synes det er vanskelig å huske episoder eller hendelser som skjedde for bare noen få dager siden (eks: husker jeg ikke hvordan jeg tilbrakte ettermiddagen kun kort tid siden).					
Jeg går fra gjenstander jeg skulle ha tatt med meg, og på grunn av dette må jeg gå tilbake for å hente dem (eks: søppelet som er klart ved døren eller skjerfet mitt når jeg går fra en cafe).					
Når jeg leser (magasiner, bøker, osv.), må jeg gå tilbake og lese de					

siste linjene på nytt for å finne viktig informasjon for å forstå teksten (for eksempel navnet på en karakter).					
Mine bevegelser er ikke godt koordinert.					
Jeg har følelsen av at bevegelsene mine bremses ned/noe tregt eller er tregere enn vanlig.					
Når jeg snakker, sliter jeg med å finne de rette ordene til rett tid.					
Når jeg snakker, klarer jeg ikke å finne de riktige ordene, men for å formidle poenget mitt, bruker jeg i stedet forklaringer eller generelle ord (for eksempel: gi meg den greia der).					
Det er vanskelig for meg å finne veien til et sted eller en destinasjon.					
Jeg blir forvirret med datoer, og jeg kan ikke huske hvilken dato det er i dag.					

Page 6:

Du blir nå bedt om å løse seks oppgaver.

For hver oppgave, velg svaret du tror er riktig.

Oppgavene som skal løses blir presentert etter hverandre.

Page 7:

8. Et balltre og en ball koster 1,10 kr totalt. Balltreet koster 1 kr mer enn ballen.

Hvor mye koster ballen?

- ☐ 0,05 kr
- ☐ 0,20 kr
- ☐ 0,10 kr
- ☐ 0,15 kr

Page 8:

9. Hvis fem maskiner bruker fem minutter på å lage fem komponenter, hvor lang tid vil 100 maskiner bruke på å lage 100 komponenter?

- ☐ 20 minutter
- ☐ 100 minutter
- ☐ 50 minutter
- ☐ 5 minutter

Page 9:

10. I en innsjø er det en flekk med vannliljer. Hver dag doubler flekken seg i størrelse.

Hvis det tar 48 dager for flekken å dekke hele innsjøen, hvor lang tid vil det ta å dekke halvparten av innsjøen?

- 47 dager
- 24 dager
- 12 dager
- 36 dager

Page 10:

11. Hvis tre alver kan pakke tre leker på en time, hvor mange alver trenger man for å pakke seks leker på to timer?

- 4 alver
- 6 alver
- 3 alver
- 8 alver

Page 11:

12. Jerry fikk både den 15. høyeste og den 15. laveste karakteren i klassen. Hvor mange elever er det i klassen?

- 30
- 27
- 29
- 32

Page 12:

13. I et idrettslag er høye medlemmer tre ganger mer sannsynlig å vinne en medalje enn korte medlemmer. I år har laget så langt vunnet 60 medaljer. Hvor mange av disse har blitt vunnet av korte utøvere?

- 30
- 15
- 40
- 20

Page 13:

14. Velg alternativet 'Uenig' for å vise at du følger med.

- Veldig uenig
- Uenig
- Hverken enig eller uenig
- Enig
- Veldig enig

Page 14:

15. Følgende uttalelser handler om hvordan arbeidet ditt kan ha påvirket deg.

Vennligst les hver uttalelse og indiker hvor ofte du har opplevd disse problemene.

	Aldri eller nesten aldri	Bare noen få dager	Mer enn halvparten av dagene	Nesten hver dag
Mitt arbeid var så stressende at jeg ikke kunne glede meg over ting jeg vanligvis liker å gjøre.				
Jeg følte meg deprimert på grunn av jobben min.				
Stress relatert til jobben førte til søvnproblemer (jeg hadde				

vanskeligheter for å sovne, sov uforstyrret, eller jeg sov mye mer enn vanlig).				
Jeg følte meg utmattet på grunn av jobben min.				
Jeg følte at appetitten min ble forstyrret på grunn av jobbstress (jeg mistet appetitten min, eller jeg spiste for mye).				
Min opplevelse på jobb fikk meg til å føle meg mislykket.				
Jobben min stresset meg så mye at jeg hadde problemer med å fokusere på det jeg gjorde (f.eks. å lese en avisartikkel) eller å tenke klart (f.eks. å ta beslutninger).				
Som et resultat av jobbstress følte jeg meg rastløs, eller det motsatte, alt gikk saktere- for eksempel i måten jeg beveget meg eller snakket på.				
Jeg tenkte at jeg vil heller være død enn å fortsette i denne jobben.				

Page 15:

Hvis du føler deg nedtrykt, har det vanskelig, og ønsker å snakke med noen om det, kan du kontakte Mental Helse på telefonnummer 116 123. Dette er en gratis og døgnåpen telefontjeneste. Husk at det å søke støtte er et tegn på styrke, og de er her for å lytte og støtte deg.

Page 16:

Takk for at du tok deg tid til å fullføre denne undersøkelsen om arbeidshelse. Din deltakelse er av stor verdi for videre forskning på området/tema.

Ved å sende inn svarene dine uttrykker du ditt samtykke til å delta i denne studien. Vi setter pris på din vilje til å bidra for å fremme kunnskapen innen arbeidshelsefeltet. Dine innsikter og erfaringer er avgjørende for å hjelpe oss med å bedre forstå og adressere viktige spørsmål knyttet til arbeidsplassens velvære.

Hvis du har ytterligere spørsmål eller ønsker å få mer informasjon om studiens funn, kan du kontakte Håkon på: Haakonfs@stud.ntnu.no

Takk for ditt verdifulle bidrag!

