Norwegian validation of

the Occupational Depression Inventory

PSY2900 Bachelor Thesis in Psychology

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Preface

As a starting point for this project, the advisor provided the group with an overview of the research and shared the project's overall aims. The advisor shared some initial supporting literature, but it was mainly the students who identified further relevant literature. The students collected the data separately using nettskjema.no before the advisor compiled the dataset into SPSS. Some items within the scales used in the study consisted of both negatively and positively worded items. The advisor reversed the scores before handing the data file to the group.

The project group had some meetings with the advisor during the semester to discuss the progress and have an arena to ask questions. Some students in the group also voluntarily met every second week without the advisor to share thoughts, ideas, and potential struggles.

I wish to thank Renzo Bianchi for supporting and guiding this project, both in terms of positive learning outcomes and motivating words of encouragement. I would also like to express my gratitude to the project group for creating a conducive learning environment and sharing thoughts and ideas regarding the project.

Abstract

Previous research on work-related distress has primarily focused on assessing burnout symptoms. However, there is an ongoing discussion around the concept´s utility in occupational research and health because it is (a) not recognized as a diagnosis, (b) lacks a standardized definition, and (c) shows overlap with depression, making it difficult to distinguish. The Occupational Depression Inventory (ODI) presents a new approach to assessing work-attributed depressive symptoms. It is a nine-item instrument designed with a diagnostic algorithm for identifying likely cases of occupational depression. The instrument includes more symptoms of work-related distress than well-known burnout measures, such as the Maslach Burnout Inventory (MBI). The ODI has already been validated in different countries across continents and in different languages. The objective of this study was to (a) validate the ODI in the Norwegian language and (b) explore the correlations of occupational depression. The English version of the ODI was translated into Norwegian using a back-translation, and data from 485 participants was collected through a convenience sample. The structural properties of the ODI were explored through factorial analysis, reliability, criterion validity, and discriminant validity. Consistent with previous validation studies of the ODI, the structural and psychometric properties were excellent in the Norwegian language. The findings suggest that the ODI can be an important part of a renewed and more unified approach to work-related distress.

Keywords: Depression, burnout, job strain, occupational health, work distress, workplace ostracism

Throughout decades of work-related distress research, burnout has been one of the main phenomena of interest. Etiologically, burnout is considered the end consequence of chronic work-related distress and adverse working conditions over a more extended period (Freudenberger, 1974; Chiu et al., 2015). However, burnout still stands as a loosely defined syndrome without a consensual definition, in addition to not being recognized as a diagnosis in either *The Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) or *The International Classification of Diseases* (ICD-10) (American Psychiatric Association, 2013; Bianchi & Sowden, 2022; World Health Organization, 2015). The concept´s controversial nosologically status is problematic due to several limitations. (1) Burnout being loosely defined may entail reliability challenges; for example, different researchers who study burnout may risk examining slightly different symptoms (Bianchi & Schonfeld, 2021; Melnick et al., 2017). And (2) since burnout is not a distinct condition in a diagnostic classification system, diagnosing a worker with burnout is impossible. This presents challenges for physicians in terms of treatment and prevention (Bianchi & Schonfeld, 2020; Bianchi & Schonfeld, 2021).

Attempts have been made to standardize burnout´s definition and assessment; one of them is the three-dimensional structure of the Maslach Burnout Inventory (MBI) (Maslach et al., 1996). The MBI measures burnout based on three main symptoms: depersonalization, emotional exhaustion, and reduced personal accomplishment (Maslach et al., 1996). The instrument has been validated across languages, making it accessible to researchers and respondents worldwide. In addition, the MBI has been tested across various fields, which allows researchers to compare research findings and conduct meta-analyses. Despite its widespread use, the instrument's psychometric properties have been found to vary across countries, contexts, and occupational groups, making it a target for criticism (Bianchi & Schonfeld, 2021; Squires et al., 2014). For instance, Bianchi and Schonfeld (2021) highlight

that the MBI is not grounded in an established theory or thorough clinical investigations. The original article on the MBI also suggests that the three symptoms of burnout should be assessed individually, giving three individual scores (Maslach et al., 1996). As a result, Bianchi and Sowden (2022) argue that burnout itself is being left unmeasured. Lastly, it could be worth mentioning that the MBI may potentially exclude significant aspects of the burnout construct since it mainly measures burnout based on three main symptoms, as pointed out by Bianchi and Sowden (2022).

The gap between work-related depression symptoms and precise mapping tools has been addressed by Bianchi and Schonfeld (2020), who recently developed the Occupational Depression Inventory (ODI). The ODI adopts a new approach to work-related distress by presenting a unidimensional instrument designed to give a single score on work-attributed depressive symptoms and their severity (Bianchi & Schonfeld, 2020). In the extension of the instrument lays a desire to establish Occupational Depression as a diagnosis that can contribute to occupational health science (Bianchi & Schonfeld, 2021). Unlike the MBI, the ODI is founded on a solid theoretical and clinical foundation, and the ODI items are based on the nine main symptoms of major depressive disorder in DSM-5 (Bianchi & Schonfeld, 2020). By basing the instrument on the diagnostic criteria for depression, the ODI aims to ensure that all critical symptoms of work-related distress are included (Bianchi & Schonfeld, 2021).

The ODI also includes a subsidiary turnover intention question with the intent to assess the conditional relation between work implications and the depressive symptoms reported by the respondents (Bianchi & Schonfeld, 2020). The ODI is a tool that helps investigators approach occupational depression in both dimensional and categorical ways. It is presented as a unidimensional measure, as Bianchi and Schonfeld (2020) explained.

The ODI has already been validated across different nations and in several languages, including Australia, Brazil, France, Italy, New Zealand, South Africa, Spain, Sweden, Switzerland, and the USA (Bianchi & Schonfeld, 2020). The validation studies found the ODI to have excellent structural and psychometric properties and to behave satisfactorily within all tested contexts (e.g., Bianchi & Cavalcante et al., 2023; Hill et al., 2021). All validation studies also indicated that the ODI is a sound measure for assessing key depressive symptoms of work-attributed distress (Bianchi & Cavalcante et al., 2023; Bianchi & Fiorilli et al., 2022).

The ODI has yet to be validated in Norway, and its usefulness in the Norwegian cultural context is therefore unclear. The Norwegian working conditions differ from other countries in several ways. Firstly, the working conditions in Norway are generally good compared to those in the rest of Europe (Aagestad et al., 2017). Norway prioritizes workers´ health, and the Working Environment Act raises awareness and addresses work-related health issues (Aagestad et al., 2017). The Working Environment Act is a law established in 1977 that protects employers' rights, ensures a good and safe working environment, and secures cooperation between employers and employees (Working Environment Act, 2005, §1-1). Secondly, some businesses are also required by law to be affiliated with the occupational health service (Working Environment Act, 2005, §3-3). The occupational health service works preventively by offering professional consultancy services to companies. Most companies in Norway also have a health and safety representative among the workers who take care of workplace safety and health aspects (Aagestad et al., 2017). And third, the governmental agency, The Norwegian Labour Inspection Authority, aims to secure an overall healthy working environment in Norway (The Norwegian Labour Inspection Authority, n.d). This includes having administrative, supervisory, and informational responsibilities for different laws and regulations focusing on occupational safety and health (The Norwegian Labour Inspection Authority, n.d.).

The objective of this study was to (1) examine how the ODI operates in a Norwegian context and in the Norwegian language by investigating reliability, factorial validity, criterion validity, and discriminant validity. Based on the findings from previous validation studies, this study expects the ODI to exhibit satisfactory psychometric and structural properties in the Norwegian language. It is also assumed that a one-factor solution will emerge, meaning that all the ODI items will load on one factor in the factor analysis.

The second part of this study aimed to (2) investigate the relevant correlation of occupational depression. The included variables in this study were workplace violence, workplace ostracism, sick leave, job promotion, socioeconomic optimism, cause-neutral depressive symptoms, age, and sex. This study aims to investigate the correlation between the ODI and a cause-neutral depression measure by using the depression subscale of the Hospital Anxiety and Depression Scale (HADS-D). Because the ODI is based on the symptoms of major depressive disorder, the ODI is expected to correlate positively with a cause-neutral measure. For instance, Bianchi and Schonfeld (2020) and Hill et al. (2021) found positive correlations between the ODI and cause-neutral depression measures such as the depression subscale of the Depression Anxiety Stress Scales-21 (DASS-21-D) and Center for Epidemiologic Studies-Depression scale (CES-D).

Workplace violence, including verbal abuse and physical violence, has shown positive correlations with depression (Bianchi & Fiorilli et al., 2022). The relationship between ostracism and depression is well documented in research, and some studies suggest a causal link between the two variables, e.g., Rubert et al. (2022). Depression among employees has been identified by The Norwegian Institute of Public Health (NIPH) as a significant contributor to the high sickness absence in Norwegian workplaces (Dalgard & Bøen, 2008). Additionally, Nyberg et al. (2017) found that both men and women reported an elevation in depressive symptoms four years after a job promotion. Another study also found that

promotion at work is associated with a decline in workers' mental health (Boyce & Oswald, 2012). Based on the state-of-art review, this study expects to find a positive association between the ODI and workplace violence (verbal abuse and physical violence), workplace ostracism, sick leave, and job promotion.

There is little research done on the relationship between socioeconomic status and occupational depression, but low socioeconomic status is often associated with a higher prevalence of depressive symptoms (Andrade et al., 2000; Lorant et al., 2003). However, Norway's robust welfare system and high standard of living may affect the participant's view on the socioeconomic future. This study expects socioeconomic optimism to be negatively correlated with the ODI.

Practical implications

According to a report from the Organisation for Economic Co-Operation and Development (OECD), mental health is a major challenge for the labor market due to the significant costs associated with sick leave (Organisation for Economic Co-Operation and Development, 2012). The Norwegian research institute, SINTEF, estimated that one week of sick leave costs around 13,000 NOK to a company (Hem, 2011). The number is likely higher; hidden costs, like efficiency, can be hard to measure. For example, Adler et al. (2006) found depressed workers to have significantly greater job performance deficits than the control group. As a result, accurate estimates of the actual costs of depression among workers can be hard to calculate.

Reducing depressive symptoms among workers is essential for reducing sick leave costs, and an important part of this is preventing work-related distress. More research in the field is needed to explore more of the correlations between depression and work-related distress. Research in the field has mainly focused on burnout, which poses a challenge for

prevention due to burnout's nosologically status (Bianchi & Sowden, 2022). The validation of the Norwegian version of the ODI can help establish a new and standardized approach to addressing work-related distress because it specifically targets occupational depression as the phenome of interest.

Method

Study Sample and Recruitment Method

During January and February 2023, data from 547 participants were collected through a convenience sampling method. Nine bachelor students collected the data by sharing the survey through personal networks, directly through connections with organizations, and via social media. To participate, the respondent had to be (a) over 18 years of age and (b) currently employed. The participation was voluntary and confidential. It did not involve any compensation, and the participants could cancel their answers at any time throughout the survey. The data was collected through a Norwegian website called nettskjema.no, and the survey had no time limit. This study was conducted in accordance with the guidelines of the Norwegian Center for Research Data.

An attention-check item was included in the survey to identify careless respondents. Of the 547 participants, 62 (11%) were identified as inattentive and therefore excluded from the final sample. The following study used data from a total of 485 participants. This includes 209 (43%) between the age of 18-34 (early career), 120 (25%) between 35-49 (mid-career), and 156 (32%) over the age of 50 (late career).

Measure of interest

The ODI

The items in the ODI are the main measure of interest and are based on nine core symptoms of major depressive disorder described in the DSM-5 (American Psychiatric Association, 2013; Bianchi & Schonfeld, 2020). This means that one symptom of major depressive disorder is represented in one item in the ODI. The represented symptoms are anhedonia, depressed mood, sleep alterations, fatigue/loss of energy, appetite alterations, feelings of worthlessness, cognitive impairment, psychomotor alterations, and suicidal ideation (Bianchi & Schonfeld, 2020). Respondents report their symptoms on a 4-point scale, ranging from "Never or almost never" to "Nearly every day," and it asses the symptoms within a two-week window (Bianchi & Schonfeld, 2020). The instrument is subsidiary with a turnover intention question: "If you have encountered at least some of the problems mentioned above, do these problems lead you to consider leaving your current job or position?". To this question, responders had four response options ("yes," "no," "I do not know," or "I did not encounter any of these problems"). The ODI is also accompanied by instructions to encourage respondents to reflect on the source of their symptoms in order to avoid hasty attributions.

The diagnostic algorithm in the ODI is inspired by the one used in the prevalent screening tool for depression called Patient Health Questionnaire-9 (PHQ-9) (Bianchi & Schonfeld, 2020; Kroenke & Spitzer, 2002). An individual scoring three or higher on at least five out of nine of the ODI items may indicate that the individual meets the criteria for a provisional diagnosis (Bianchi & Schonfeld, 2020). However, the provisional diagnosis can only be given if at least one of the items is either anhedonia (item 1) or depressed mood (item 2) (Bianchi & Schonfeld, 2020).

As part of the validation process of the ODI in Norway, a back-translation from English to Norwegian was employed. Two native Norwegian speakers who were fluent in English translated the English version of the ODI into Norwegian. Subsequently, two other

native Norwegian speakers translated the Norwegian version back into English. The research team then compared the English version generated by the back-translation to the original English version. We did not identify any problematic discrepancies in the translation. The translators involved in both the English-to-Norwegian and the Norwegian-to-English translations had no prior knowledge of the measure before undertaking the translation process. The items of the ODI are available in Norwegian and English in Table 1.

Table 1

Norwegian version of the items of the Occupational Depression Inventory (ODI)

Symptoms	Items
Anhedonia	Mitt arbeid var så stressende at jeg ikke klarte å glede meg over ting jeg vanligvis liker å gjøre. *My work was so stressful that I could not enjoy the things that I usually like doing.*
Depressed mood	Jeg har følt meg deprimert på grunn av jobben min. *I felt depressed because if my job.*
Sleep alterations	Stress relatert til jobben har ført til søvnproblemer (Jeg opplevde det som vanskelig å sovne og sove uforstyrret, eller jeg sov mye mer enn vanlig). *The stress of my job caused me to have sleep problems (I had difficulties falling asleep or staying asleep, or I slept much more than usual).*
Fatigue/loss of energy	Jeg har følt meg utmattet på grunn av arbeidet mitt. *I felt exhausted because of my work.*
Appetite alterations	Jeg har følt at appetitten min ble forstyrret på grunn av jobbstress (jeg mistet appetitten min, eller det motsatte, jeg spiste for mye). *I felt my appetite was disturbed because of the stress of my job (I lost my appetite, or the opposite, I ate too much).*
Feeling of worthlessness	Min opplevelse på jobb fikk meg til å føle meg mislykket. *My experience at work made me feel like a failure.*
Cognitive impatience	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). *My job stressed me so much that I had trouble focusing on what I was doing (e.g., reading a newspaper article) or thinking clearly (e.g., to make decisions).*
Psychomotor alterations	Som et resultat av jobbstress følte jeg meg rastløs, eller det motsatte, alt gikk saktere - f.eks. i måten jeg beveget meg eller snakket på. *As a result of job stress, I felt restless, or the opposite, noticeably slowed down – for example, in the way I moved or spoke.*

| Suicidal ideation | Jeg har tenkt at jeg heller ville vært dø enn å fortsette i denne jobben. *I thought that I'd rather be dead than continue in this job.* |
| Turnover intention (SQ) | Dersom du har støtt på minimum noen av problemene nevnt tidligere, fører disse problemene til at du vurderer å slutte i din nåværende jobb eller stilling? *If you have encountered at least some of the problems mentioned above, do these problems lead you to consider leaving your current job or position?* |

Note. SQ: subsidiary question.

Depression subscale

The survey included the 7-item depression subscale of the Hospital Anxiety and Depression Scale (HADS-D) to assess cause-natural depressive symptoms (Bianchi & Schonfeld, 2020; Eriksen et al., 2019). The HADS-D has been demonstrated to be a valid screening tool for depression symptoms in a Norwegian context (Eriksen et al., 2019). Respondents were asked to provide ratings of their symptoms over one week by selecting one of five response options, ranging from "I strongly disagree" to "I strongly agree." Two examples of HADS-D items are: "I no longer care about how I look" and "I look forward to events and things with joy."

Workplace Ostracism Short Scale

Workplace ostracism can be defined as "the extent to which an individual perceives that he or she is ignored or excluded by others at work" (Ferris et al., 2008, p. 1348). The Workplace Ostracism Short Scale was added to the survey to investigate this phenome. Respondents answered how often they had experienced the following four ostracism scenarios during the last two months: "Others ignored me," "Others shut me out of the conversation," "Others treated me like I was not there," and "Others did not invite me to activities." The respondents chose an answer on a five-point response scale from "Never" to "Always."

Additional measures

Workplace violence. Two questions were presented to the respondents to address workplace violence. The survey asked if the respondent had experienced (a) physical violence and (b) verbal abuse in the context of their work. The available options for respondents to choose from were "Yes," "No," and "I do not know."

Sick leave and job promotion. Respondents answered whether they had been (a) on sick leave and (b) promoted in their work during the last six months. The job promotion referred to any elevation in job rank or salary, and the respondents were presented with a binary response option, "Yes" or "No."

Socioeconomic optimism. The respondents were requested to express their level of optimism regarding the socioeconomic future of Norway using a five-point scale. The response options ranged from "Not optimistic at all" to "Extremely optimistic."

Age, sex, and work. The survey provided two open-ended questions for participants to enter their age and occupation and a question to identify their gender.

Data analysis

A factor analysis with a Maximum Likelihood Extraction method was conducted to investigate the underlying structure of the ODI. A Promax rotation was used to allow the factors to correlate. Kaiser-Meyer-Olkin (KMO) and Bartlett´s test of sphericity were used to determine whether the data were suitable for conducting factor analysis. This study used a threshold of .40 for factor loading cutoffs, as Hair et al. (1998) suggested for a sample bigger than 200.

The multi-item scales, including the nine-item ODI, the seven-item depression subscale of the HADS, and the four-item Ostracism Short Scale, underwent reliability tests. The total-score reliability was estimated by using two indicators: Cronbach´s α and

McDonald´s ω. This study followed the commonly accepted threshold for good reliability of .80 and excellent reliability of .90 (Cortina, 1993). The HADS-D scale had positively and negatively worded items, and questions 4 and 5 were reversed before conducting the reliability analysis.

Pearson correlation *r* was used to estimate the ODI´s criterion validity. This study focused on the concurrent validity aspect of criterion validity because the study was cross-sectional. Variables such as age, sex, physical violence, verbal abuse, workplace ostracism, sick leave, job promotion, and socioeconomic optimism were included in the analysis.

The discriminant validity was tested to assess if the ODI reflects dissimilar aspects of unrelated work-depression scales such as HADS-D. Discriminant validity is a method used to determine if two measures, which should not be related, are actually measuring different things. The issue was addressed by using Pearson correlation *r*. A correlation close to 0 indicates that the two scales measure completely different things, and a correlation closer to 1 indicates a high discriminant validity. This study expects some degree of discriminant validity because the ODI is based on the measure of major depressive disorder. A discriminant validity markedly higher than .50 and below .70 could indicate such findings (Bianchi & Manzano-García et al., 2022; Post, 2016).

Results

Of the 485 participants, this study identified 11 respondents (approx. 2%) likely to meet the criteria for a job-ascribed depression. The turnover question indicated that 149 (31%) considered leaving their current job due to their occupational depression symptoms, whereas 175 participants (approx. 36 %) stated that they did not want to leave their job. The remaining 161 participants (approx. 33 %) answered that they were unsure if they wanted to leave their job or had not encountered any of the problems during the last two weeks. The

scores on the individual ODI items ranged from 0.000 to 3.000. 75 % of the participants (n = 365) scored between 0.000 and 0.999, 22% (n = 105) scored between 1.000 and 1.999, and 3 % (n = 15) scored between 2.000 and 3.000.

Table 2

Descriptive statistics for the Occupational Depression Inventory (N = 485)

Indicators	ODI1	ODI2	ODI3	ODI4	ODI5	ODI6	ODI7	ODI8	ODI9	Total score
Mean	0.75	0.60	0.84	1.03	0.57	0.65	0.55	0.59	0.10	0.63
SD	0.82	0.80	0.90	0.91	0.84	0.79	0.73	0.82	0.40	0.58
Skewness (*SE* = 0.111)	0.94	1.32	0.81	0.65	1.41	1.22	1.14	1.34	4.95	1.20
Kurtosis (*SE* = 0.221)	0.36	1.22	-0.24	-0.32	1.18	1.12	0.59	1.12	27.10	1.35
Minimum	0	0	0	0	0	0	0	0	0	0.00
Maximum	3	3	3	3	3	3	3	3	3	3.00

Note. SE = standard error; ODI1: anhedonia, ODI2: depressed mood, ODI3: sleep alterations, ODI4: fatigue/loss of energy, ODI5: appetite alterations, ODI6: feeling of worthlessness, ODI7: cognitive impairment, ODI8: psychometric alterations, ODI9: suicidal ideation.

Reliability

The ODI showed very good McDonald´s ω and Cronbach´s α values, ω = .900, α = .893. McDonald´s ω and Cronbach´s α values for HADS-D were 851 and .847, respectively. The Ostracism Short scale showed an ω of .856 and an α of .853. The values indicated that the internal consistency for all three multi-item scales could be considered satisfactory.

Factorial validity

A maximum likelihood factor analysis was conducted on the nine ODI items with a Promax rotation. The Kaiser-Meyer-Olkin (KMO) measure identified the sampling adequacy as marvelous, KMO = .92, and Bartlett´s test of sphericity was significant $p < .001$ (Kaiser, 1974). KMO and Bartlett´s test indicated that the data could be used for factor analysis. One

factor emerged based on Kaiser's criterion and an examination of the scree plot (Kaiser, 1960). Kaiser´s criterion extracts components with eigenvalue over 1.0 (Kaiser, 1960).

The extracted factor is referred to as the Occupational Depression factor, and the variance of the ODI items explained 49% of the total variance. The factor analysis revealed that all the individual items in the ODI exhibited strong loadings on the factor ($M = .69$, $SD = .12$, range $= .38$), as all were above the acceptable threshold of .40 (Hair et al., 1998). The highest proportion of each variable's variance that the Occupational Depression factor could explain was ODI4 (fatigue/loss of energy), ODI1 (anhedonia), and ODI7 (cognitive impairment). The Occupational Depression factor explained 62% of the variance of ODI4, 61% of the variance of ODI1, and 60% of the variance of ODI7. ODI9 (suicidal ideation) was the least endorsed ODI item, and it explained 17% of the variance. See a summary of the factor analysis in Table 3.

Table 3

*Summary of factor analysis of the Occupational Depression items (*N = 485)

	Occupational Depression factor	Communalities
ODI 1: Anhedonia	**.78**	**.61**
ODI 2: Depressed mood	**.72**	**.52**
ODI 3: Sleep alterations	**.72**	**.52**
ODI 4: Fatigue/loss of energy	**.79**	**.62**
ODI 5: Appetite alterations	**.66**	**.44**
ODI 6: Feeling of worthlessness	**.64**	**.41**
ODI 7: Cognitive impairment	**.77**	**.60**
ODI 8: Psychometric alterations	**.73**	**.53**
ODI 9: Suicidal ideation	**.41**	.17
Eigenvalue	4.89	
% of variance	49	
Total variance	49	

Note. Factor loadings higher than .40 are reported in bold. Extraction method was maximum likelihood. As only one factor was extracted, the solution cannot be rotated. Values are reported from Factor Matrix.

Criterion validity

We found a moderate positive correlation between the ODI and workplace ostracism, $r(483) = .42, p < .001$. Positive associations were also found between the ODI and all of the individual items in workplace ostracism. The largest correlation was between the ODI and item 1 ("Other ignored me"), $r(483) = .39, p < .001$, followed by item 2 ("Others shut me out of the conversation"), $r(483) = .37, p < .001$, and item 3 ("Others treated me like I was not there"), $r(483) = .36, p < .001$. The correlation between the ODI and workplace ostracism items 1, 2, and 3 were all considered moderate. A small correlation was found between the ODI and item 4 ("Others did not invite me to activities"), $r(483) = .27, p < .001$.

Among the other main variables, the biggest correlation was found between the ODI and socioeconomic optimism, $r(483) = -.31, p < .001$, followed by a small correlation with sick leave, $r(483) = .26, p < .001$ and verbal abuse, $r(483) = -.22, p < .001$. A small negative association was found between the ODI and sex, $r(483) = -.19, p = <.001$, and age, $r(483) = -.14, p = <.001$. The correlation between the ODI, physical aggression, and job promotion was $< .10$, and job promotion did not show a significant result, $r(483) = -.07, p = .117$. The correlations between the main study variables are presented in Table 4.

Table 4

Pearson Correlations of the Main Study Variables (N = 485)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. ODI	-	.66***	.42***	.09*	.22***	.26***	-.07	-.31***	-.14**	-.19***
2. HADS-D		-	.41***	.02	.09	.25***	-.10*	-.32***	-.13**	-.08
3. Workplace Ostracism			-	.01	.19***	.15***	-.05	-.24***	.02	-.02
4. Physical aggression				-	.33***	.02	-.06	-.03	-.17***	-.01
5. Verbal Abuse					-	.06	-.02	-.22***	-.18***	-.02
6. Sick leave						-	-.04	-.15**	.02	-.13**
7. Job promotion							-	.05	-.11*	.04
8. Socioeconomic optimism								-	-.00	.07
9. Age									-	.06
10. Sex										-

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

Discriminant validity

The discriminant validity of the ODI and HADS-D were tested using Pearson's *r*. The two measures had a large positive correlation, $r(483) = .66$, $p < .001$. Although there is a correlation between the ODI and HADS-D, it is not a perfect ($r = 1.00$) or a close-to-perfect (e.g., $r = .90$) correlation.

Discussion

The two main objectives of this study were (a) to validate the Norwegian version of the ODI and (b) to explore the correlations associated with occupational depression. The ODI was translated into Norwegian using a back-translation approach, and its psychometric properties were evaluated through reliability tests, factor analysis, criterion validity, and discriminant validity. Based on previous validation studies of the ODI, this study expected a one-factor structure to emerge and the ODI to show satisfactory psychometric and structural properties in the Norwegian language. Relevant correlations with the ODI were explored, and this study expected a positive correlation between the ODI and the variables workplace ostracism, workplace violence, sick leave, and job promotion. It was also expected to find a negative correlation between the ODI and socioeconomic optimism. The Norwegian validation of the ODI can be seen as a part of a new establishment of a renewed and more unified approach to work-related distress.

Main Findings

As expected in the hypotheses, this study found the Norwegian version of the ODI to be psychometrically and structurally satisfactory in Norwegian.

The factor analysis emerged as a one-factor solution where all the nine ODI items strongly loaded on the Occupational Depression factor. This was in accordance with this

study's hypotheses, in addition to what has been found in other validation studies of the ODI (e.g., Bianchi et al., 2023; Bianchi & Fiorilli et al., 2022; Bianchi & Manzano-Gracía et al., 2022).

All Cronbach´s α and McDonald´s ω values of the multi-item scales were above the accepted threshold for good reliability of .80. This indicated that the internal consistency for all three multi-item scales could be considered satisfactory.

The discriminant validity indicated a large positive association between the ODI and the HADS-D. A correlation between the ODI and HADS-D were expected because both are based on the general symptoms of depression (American Psychiatric Association, 2013; Bianchi & Schonfeld, 2020; Snaith & Zigmond, 1986). Despite this, there was still a significant difference between them. This is a good sign in this context because the two tests have different purposes; the ODI targets work-related depressive symptoms, while the HADS-D is a measure for cause-natural depressive symptoms. The correlation in this study was .66, and a remarkably higher correlation, such as .90 or .80, could suggest that the ODI may not be effective in evaluating work-related symptoms.

As anticipated in the hypotheses, the ODI also showed significant positive correlations with workplace ostracism, workplace violence, and sick leave and a negative correlation with socioeconomic optimism. This study expected a negative correlation between job promotion and depression, but the association in this study was nonexistent. The correlations between these variables will be discussed further.

Correlations with Occupational Depression

Part two of this study's aim was to investigate the correlates of occupational depression further. World Health Organization (WHO) mentions that poor working environments, such as violence, harassment, discrimination, and exclusion at work, pose a

risk to workers´ mental health (World Health Organization, 2022). The findings in this study highlight some of the same risk factors. However, it is essential to keep in mind that correlation alone cannot determine the relationship between two variables. Causality provides more insight into the relationship between cause and effect.

Workplace Ostracism and Workplace Violence

This study found that all the individual ODI items had a significant small to moderate positive correlation with workplace ostracism. This indicates that a higher score of work-related depressive symptoms is associated with a higher feeling of being ignored or excluded in the workplace. The present study did not investigate the causal relationship between depression and ostracism. However, a three-year longitudinal study by Rudert et al. (2021) found a bidirectional correlation between the two variables. Their findings indicated that experiencing ostracism predicted depression three years later, and depressive symptoms could sometimes predict ostracism (Rudert et al., 2021).

All the individual ODI items had a significantly small positive correlation with verbal abuse (e.g., insults, yelling, ridicule, threats, and/or harassment). In contrast, no considerable correlation was found between physical aggression and the ODI. This finding is somewhat noteworthy because research typically finds a clear association between physical violence and depression (e.g., Radell et al., 2021). However, Dye (2020) examined the long-term consequences of verbal and physical abuse and found that verbal abuse had a bigger negative effect than physical violence. This reinforces the findings in the study, indicating that verbal abuse in the workplace may have a bigger impact on depression than physical violence.

The Working Environment Act regulates the psychosocial work environment in Norway, stating that "Employees shall not be subjected to harassment or other improper conduct" (Working Environment Act, 2005, §4 – 3). A report on Norwegian workplaces

stated that women are more exposed to humiliating behavior, unwanted sexual attention, harassment, threats, and physical violence than men (Aagestad et al., 2017). The higher prevalence of demeaning behavior towards women compared to men may indicate a potential gender bias that needs to be addressed, even though no significant difference was found between men and women in this study.

The correlation between the ODI and workplace ostracism was greater than the correlation between the ODI and verbal abuse. This is in accordance with findings from O´Reilly (2015), that found ostracism to have a bigger negative impact on workers' mental health than verbal abuse. From a psychological perspective, these findings can be sensible because the "need to belong" has been presented as one of the most essential and fundamental human traits (e.g., Bowlby, 1969; Freud, 1930; Maslow, 1968). The "need to belong" refers to humans' intrinsic motivation to form social bonds and to be included in communities, and it is seen as an essential mechanism that has made humans survive in ancestral history (Baumeister & Leary, 1995).

According to Sommer et al. (2001), individuals who are ostracized often report higher levels of negative emotions, including rejection, sadness, and low self-worth. These emotions are all linked to a sense of unworthiness, which is reflected in the ODI item 6. This may potentially explain some of the association between the ODI and workplace ostracism.

The empirical findings just reviewed indicate the severity of ostracism and its potentially dangerous consequences. Organizations may benefit by improving their working conditions to reduce the occurrence of both depression and ostracism. For example, two Norwegian studies found that social support from the employer and fair treatment from the management and colleagues had a protective effect against depression (Finne et al., 2014; Foss et al., 2010). A report from the National Institute of Occupational Health (STAMI) states that around 10% of Norwegian workers feel that they do not receive enough social support

from their colleagues (Aagestrad et al., 2017). To help address this issue, World Health Organization (2022) recommends training the management at workplaces to protect and promote mental health issues at work.

Job Promotion

World Health Organization states that under- or over-promotion is a risk factor for developing psychological symptoms. However, this study found no correlations between job promotion (e.g., higher status or higher income) and the ODI (World Health Organization, 2022). In support of these findings, Bianchi and Fiorilli et al. (2022) also found an absence of correlation between the ODI and job promotion. Even though some studies suggest that promotion opportunities are an important contributor to work satisfaction and better well-being, the findings in this study may indicate that this does not apply to the Norwegian workplace. For example, Kalleberg and Mastekaasa (2001) assessed that having chances for career growth might not be the most critical job facets for Norwegians. For Norwegian employees, having a good work-life balance is highly valued, meaning that a job promotion does not necessarily affect the worker's satisfaction (Aagestad et al., 2017). The low correlation may also be due to the possibility that the positive effects of a job promotion could elapse rapidly, leading to a quick return of the employee's earlier level of well-being at work. Because well-being at work depends on many different factors, it could be helpful for organizations to focus on enhancing job quality rather than solely focusing on the opportunities for job promotion.

Socioeconomic Optimism and Sick Leave

As anticipated in the hypotheses, socioeconomic optimism negatively correlated with the ODI, while sick leave was positively correlated. This indicates that a higher ODI score is

associated with less socioeconomic optimism and a higher chance of being on sick leave. A positive correlation between sick leave and the ODI was expected in accordance with previous research and reports (Aagestad et al., 2017; Amiri & Behnzhad, 2021). However, this study also found a small negative correlation between socioeconomic optimism and sick leave. This correlation may appear somewhat surprising, as Norway is known to be a well-developed welfare state with several social and economic safety nets, such as NAV. Norwegian employees are, for example, entitled to sickness benefits from NAV if they are on sick leave. However, the socioeconomic optimism item in this study pertains to Norway's future rather than the future of the individual. In the last few years, Norway has been named one of the best countries to live in, yet the economic downturn worldwide may affect the respondent's perspective on the socioeconomic future of the country (Statistics Norway, 2023).

Burnout vs. Occupational depression

The debate has reigned over the utility of burnout in occupational health. Until now, the MBI is the best-known measurement of burnout (Maslach et al., 1996; Williamson et al., 2018). Bianchi and Schonfeld presented a new approach to work-related distress: the Occupational Depression Inventory. The MBI and the ODI are both designed to assess work-related distress symptoms but differ in their approach and focus.

The diagnostic algorithm is a substantial benefit of the ODI. It provides a standardized measure of the symptoms and their severity and can determine if an induvial meets the criteria for a provisional occupational depression diagnosis. As mentioned, the MBI is unable to do so because burnout is not recognized as a distinct diagnosis in the DSM-5 or ICD-10 (American Psychiatric Association, 2013; Bianchi et al., 2021; World Health Organization, 2015). Although the MBI presents one characterization of burnout, it is challenging when the

definition is inconsistent across domains. For example, Rotenstein et al. (2018) found 142 definitions of burnout in a study among physicians. This indicates that the field needs a more united approach to the subject, and the ODI may be a constructive contribution.

The ODI gives a single score on occupational depression, while the MBI presents three individual scores based on the main symptoms (Maslach et al., 1996). Additionally, the ODI consists of only nine items making it relatively short compared to the MBI, which comprises of 22 items (Aguayo et al., 2011). The length of the instrument and the possible difficulties in interpreting the result of the MBI can indicate that the ODI is a more convenient measurement tool for physicians to use.

Another difference between the two instruments is which symptoms they assess. Bianchi and Sowden (2022) pointed out that the MBI may exclude significant aspects of the burnout construct. A symptom that is left out of the MBI but included in the ODI is suicidal ideation. This study found that the ODI item assessing suicide ideation only explained 17% of the variance of the Occupational Depression factor. The findings are in accordance with other validations studies of the ODI that found suicidal ideation to be the least commonly endorsed ODI item (Bianchi et al., 2023; Bianchi & Schonfeld, 2020). However, the correlation between suicidal thoughts and depression has been found to be significant across cultures and over the years (e.g., Desseilles et al., 2012). Bianchi and Schonfeld (2020) highlight that not everyone that is depressed has suicidal thoughts. However, suicidal ideation is often an important severity marker in depression and should therefore be included in this ODI. It is also likely that the low variance explained by the suicidal item is due to this study having a healthy sample not representative of the general population.

Limitations

There are some limitations to this study that are worth acknowledging. Firstly, this study used a convenience sampling method. Although the sample included individuals with varying ODI scores, the sample's representativeness remains uncertain. Therefore, the findings cannot be generalized to the Norwegian working population. A random sampling method could be used to ensure sample representativeness, but this method is often costly and difficult to implant. Additional replications of the Norwegian workforce are necessary to ensure a more accurate representation. Future replications of the ODI in Norway should also translate the survey into minority languages, such as Sami, to ensure that all parts of the Norwegian population are included.

Secondly, this survey was based on self-reported data. It is important to be cautious when interpreting the findings, as they may be affected by response bias. Social desirability is an example of a possible response bias, in which respondents tend to provide answers they believe are in accordance with what is socially acceptable (Nederhof, 1985). Collecting data anonymously is a method to reduce social desirability bias. This study ensured the participants that their answers would remain anonymous to encourage more honest answers.

Thirdly, this study used a cross-sectional design, which does not provide information about the causality. A longitudinal design could make it possible to investigate further aspects of the ODI, such as test-retest reliability. Previous validation studies of the ODI have also used a cross-sectional design, so it could be interesting to investigate the ODI and occupation depression correlations with longitudinal data.

Conclusion

This current study explored the Norwegian version of the ODI and found the instrument to exhibit excellent psychometric and structural properties in the Norwegian language. The findings also relate occupational depression to variables such as workplace

violence, workplace ostracism, sick leave, and socioeconomic optimism. It should be emphasized that the findings in this study do not provide insight into the causal relationship between the variables. Further research on this relationship would be valuable to better understand the complexity and underlying causes of occupational depression. As stated, burnout has several problematic aspects due to its nosologically status, and the ODI appears to be a potentially valuable instrument without these limitations. Firstly, the ODI clearly defines the end consequences of work-related distress and introduces specific diagnostic criteria for measuring occupational depression. These criteria create an opportunity for occupational depression to be recognized as a distinct diagnosis. This would be an advancement for occupational health specialists, as they could treat and prevent occupational depression.

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