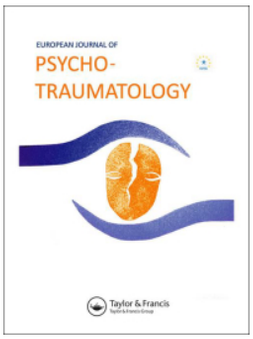

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CLINICAL RESEARCH ARTICLE

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Predictors of work ability among victims of severe interpersonal violence: a file-based study in Germany

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ABSTRACT

Background: Work ability has been rarely studied among victims of violence.
Objective: The study aimed at identifying predictors of work ability among victims of severe violence.
Method: In a retrospective file-based study, characteristics of 189 adult victims of violence from Germany were obtained using a standardized category system. We used decision tree analysis to examine predictors of the occupational status after victimization.
Results: The average age of victims (64.6% female) at the time of the crime was 30 years. Mostly physical (41.8%) and sexual violence (39.2%) was reported. 85.2% of the victims had at least one mental disorder, most commonly posttraumatic stress disorder (PTSD; 55.5%) and depressive disorders (23.3%). 50.3% of victims were unemployed, and work-related participation was the most impaired participation domain. Decision tree analysis revealed the sex of the victim as the first predictor of occupational status, with women more likely to be unemployed than men. Among women, diagnosis of a depressive disorder differentiated best between unemployment and employment, while in men, multiple victimizations emerged as the strongest predictor of unemployment; however, very few multiply victimized men in our sample ($n = 10$) warrant cautious interpretation.
Conclusions: Victims of severe violence are substantially impaired in their work ability. Given the adverse individual and socioeconomic consequences of unemployment, an early focus on work-related participation seems highly relevant. Our study suggests that female victims and those with depressive disorders might be in particular need for these measures, but prospective studies are required to back this implication. Low-threshold access to trauma clinics represents an important step and could be complemented by work-focused interventions.

Factores predictivos de la capacidad laboral entre las víctimas de violencia interpersonal grave: un estudio basado en expedientes en Alemania

Antecedentes: La capacidad laboral ha sido poco estudiada entre las víctimas de violencia.
Objetivo: El estudio tuvo como objetivo identificar factores predictivos de la capacidad laboral entre las víctimas de violencia grave.
Método: A través de un estudio retrospectivo, utilizando un sistema de categorización estandarizado basado en registros de Alemania se obtuvieron características de 189 adultos víctimas de violencia. Utilizamos análisis de árbol de decisión para examinar los predictores de la situación laboral tras el delito.
Resultados: La edad promedio de las víctimas (64,6% mujeres) al momento del delito fue de 30 años. Se reportó principalmente violencia física (41,8%) y sexual (39,2%). El 85,2% de las víctimas tenía al menos un trastorno mental, siendo los más comunes el trastorno de estrés postraumático (TEPT; 55,5%) y los trastornos depresivos (23,3%). El 50,3% de las víctimas estaban desempleadas, y la participación laboral fue el ámbito más afectado. El análisis del árbol de decisiones reveló que el sexo de la víctima era el principal predictor de la situación laboral, siendo las mujeres más propensas al desempleo que los hombres. Entre las mujeres, el diagnóstico de un trastorno depresivo fue el factor que mejor diferenció entre desempleo y empleo, mientras que en los hombres, la victimización múltiple se reveló como el predictor más fuerte de desempleo; sin embargo, el escaso número de hombres victimizados en múltiples ocasiones en nuestra muestra ($n = 10$) justifica una interpretación cautelosa.

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KEYWORDS
Victims of violence; interpersonal violence; work ability; trauma disorders; file analysis; German Victim Compensation Act

PALABRAS CLAVE
Víctimas de violencia; violencia interpersonal; capacidad laboral; trastornos traumáticos; análisis de expedientes; Ley alemana de indemnización a las víctimas

HIGHLIGHTS

- Work ability has been rarely studied among victims of violence.
- Sex and, in women, the diagnosis of depressive disorders best predicted work ability among victims of severe violence, with depressed female victims at the highest risk of unemployment.
- Victims of severe violence are particularly impaired in this area, highlighting the importance of work-focused interventions.

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Conclusiones: Las víctimas de violencia grave ven sus capacidades laborales considerablemente afectadas. Dadas las consecuencias adversas, tanto individuales como socioeconómicas, del desempleo, resulta fundamental centrarse en la participación laboral desde una etapa temprana. Nuestro estudio sugiere que las mujeres víctimas y las personas con trastornos depresivos podrían necesitar especialmente estas medidas, pero se requieren estudios prospectivos para confirmar estas implicaciones. El acceso sencillo a clínicas especializadas en trauma representa un paso importante y podría complementarse con intervenciones orientadas al trabajo.

1. Introduction

Acts of intentional and serious interpersonal violence (IV; e.g. sexual abuse, rape, bodily harm) often have long-term negative outcomes for the victims, including physical, psychological, and behavioural sequelae (World Health Organization [WHO], 2002). Following IV, posttraumatic stress disorder (PTSD), anxiety and depressive disorders often occur, which may be accompanied by suicidal ideation and behaviour (Campbell, 2002; WHO, 2002). These serious effects on health and behaviour often result in impairments in work ability. Previous studies showed increased absenteeism and reduced productivity and concentration levels among victims (Swanberg et al., 2005; Wathen et al., 2015). A Canadian survey found that 81.9% of victims of domestic violence experienced negative effects on job performance and almost 10% lost their jobs due to it (Wathen et al., 2015), therefore, generating considerable socioeconomic costs: The European Institute for Gender Equality (EIGE, 2021) estimated nearly €175 billion costs of intimate partner violence in the European Union in 2019, with approximately 12.5% (i.e. €21.87 billion) attributed to lost economic output.

Occupational functioning is often studied via return-to-work (RTW) rates. So far, predictors of RTW among trauma patients have been mostly analysed after accidents and medical treatment. A study of severely injured patients identified impairment, cognitive complaints, physical injury severity, and the discharge destination (home vs. inpatient rehabilitation centre) as predictors of RTW after 15 months (Holtslag et al., 2007). Similarly, low injury severity, no severe head injury, a low depression score, and optimistic life orientation were found to be predictive of RTW after 12 months in a Norwegian study (Tøien et al., 2012). RTW has also been examined in people with common mental disorders (CMD; which are frequent in victims of violence). A recent meta-analysis (Fisker et al., 2022) identified higher age, being male, previous sickness absence and higher symptom scores (see also Bjørkedal et al., 2023) in depressive, anxiety or stress-related disorders as predictors decreasing RTW probability. Current research also highlights psychosocial resilience factors such as RTW self-efficacy, perceived social, particularly workplace support, and (illness-specific) coping strategies positively influencing RTW across physical and mental health conditions (e.g. Fan et al., 2019; Lidolt et al., 2025; Schwarz et al., 2023). Studies on predictors of occupational functioning among victims of violence are rare. A German study examined victims of IV applying for state compensation under the former Victim Compensation Act (named: Opferentschädigungsgesetz, OEG; Franke et al., 2019). Until the new Social Compensation Act (named: Soziales Entschädigungsrecht, SER) was enacted at the beginning of 2024, the OEG set out measures designed to restore participation for victims of severe violence. In that study, explorative analyses revealed that for victims employed prior to the offense, occupational status at application was predicted by age at victimization and the extent of injury consequences, but not by sex, PTSD or depressive disorders (Franke et al.).

Two other studies measured occupational functioning in traumatized patients via participation impairment, commonly assessed by the International Classification of Functioning, Disability and Health (ICF; WHO, 2001). In the ICF, work and employment is one aspect of the domain major life areas. Brenner et al. (2019) found a significantly lowered self-reported qualitative and quantitative work ability in (complexly) traumatized patients (70.1% female; unemployment around 75% in PTSD and 88% in cPTSD patients before psychosomatic rehabilitation). Predictors of impairment were not analysed in this study. In another OEG-based sample, Wulfes et al. (2022) examined predictors of general participation, including work-related participation. Unemployment after the crime was associated with higher general participation impairment, which was also predicted by more severe consequences of injury and a closer offender-victim relationship.

Considering the limited research, the present study analysed predictors of work ability among adult victims of severe IV in Germany applying for state compensation under the OEG, using their occupational status at application as the outcome. Even though occupational status gives no information on specifics of work ability (e.g. part-time vs. full time work), it is an objective measure less

prone to bias and/or inconsistencies in rater judgments than other measures of occupational functioning. Moreover, in our sample, the substantial missing data in the work-related participation dimension (over 20%) argued against this dimension as the criterion; nonetheless, we still examined it descriptively.

Based on files of OEG application procedures, we examined various characteristics of the victims, offenders, and crimes. Previous studies suggest that physical injury severity (Holtslag et al., 2007; Tøien et al., 2012) and the extent of the consequences of the injury (Franke et al., 2019) influence employment of trauma patients. Also, the age of the victim (Fisker et al., 2022; Franke et al., 2019) and the presence of depressive or anxiety disorders (Fisker et al., 2022; Tøien et al., 2012) appear to affect work ability. Evidence also suggests greater work-related impairment in men with CMD (Fisker et al. 2022), but also female victims of domestic violence (Wathen et al., 2015). A close offender-victim relationship led to greater impairment in general participation in a German study (Wulfes et al., 2022). Acquaintance with the offender (Kunst et al., 2010), multiple violent experiences (Ferrari et al., 2016; Howard et al., 2010) and a longer time since victimization (Kunst et al.) also increase the risk for mental disorders – such as depressive disorders, and PTSD. Mental disorders, in turn, are associated with impairments in work ability (Brenner et al., 2019; Linden et al., 2015a).

Given these heterogeneous findings and the lack of studies on victims of severe IV, we did not formulate directional hypotheses in the present study. Instead, a theory-informed, exploratory approach using non-parametric decision tree analyses was applied to address the following research questions: First, which of the predictors of work ability and occupational functioning reported in the literature on trauma, IV and CMD emerge as relevant (i.e. are selected as the best predictors) in our sample of victims of severe violence? Second, how do the strongest predictors jointly influence work ability, as revealed by the structure of the decision tree? Based on previous research, sex and age at victimization, the presence of physical consequences, diagnoses of a depressive disorder and PTSD, the extent of the consequences of the injury, the offender-victim relationship, the frequency of violent experiences, and the time since victimization were included in our analyses.

2. Methods

2.1. Sample

Our final sample consisted of $N = 189$ adult victims of severe IV in Germany who applied for state compensation. Under the OEG, victims who suffered physical or psychological damage as a result of an intentional act of violence, or their surviving dependents, were entitled to state compensation (formerly §1, section 1 and 5, OEG) to mitigate the individual consequences of violence and restore social participation. Compensation comprised financial and medical-therapeutic benefits (i.e. pensions, medical treatment, occupational rehabilitation) according to the Federal Pensions Act (German: Bundesversorgungsgesetz, BVG; formerly §1, section 1, OEG). The scope of these benefits is measured by the severity of health damage, the so-called 'degree of the consequences of the injury' (Grad der Schädigungsfolgen, GdS; formerly §30, section 1, BVG). To enhance practical support for victims of violence, the new SER replaced the OEG and BVG at the start of 2024; however, underlying principles largely remain.

2.2. Procedure

The file analysis was conducted between June 2019 and February 2020 in cooperation with the Lower Saxony State Office for Social Affairs, Youth and Families and followed its institutional guidelines; as there was no direct contact with victims, separate ethical approval was not required. Two advanced master's students coded 245 files of OEG application procedures between 2004 and 2018 (split equally), randomly selected by State Office employees depending on the presence of a psychiatric or psychological report. Raters were randomly assigned to their files; both raters and selecting State Office employees were unaware of the research question and the outcome variable of the present study and can therefore be considered blinded. In very rare cases of uncertainty among raters, final decisions were made by an expert psychological rater (CK). Consistent with the study's focus on adult victims of IV, 43 files pertaining to minors or individuals of compulsory school age were excluded from further analyses. Files contained, among other information, the application for state compensation under the OEG, information on victims, offenders, and crime, as well as psychiatric or psychological reports.

2.3. Measures

The category system used to code the files was developed in 2013 by a research group at the Technical University of Braunschweig based on literature research, anonymised sample files, and various measures for sexual abuse and rape. A slightly revised version (Franke et al., 2019) with six domains (demographic data, family and social characteristics, trauma-specific and health characteristics, offender and offender-victim relationship characteristics, crime characteristics, legal and governmental information) was applied in our study. The interrater reliability of the revised nominal category

system was good (Cohen's $\kappa 1 = .74$, $SD = .20$; $\kappa 2 = .77$, $SD = .24$). Information on occupational status (at application; 1 = *unemployed,* 2 = *employed*), victim sex and age, physical consequences of the injury (0 = *no*, 1 = *yes*), the diagnosis of a mental disorder (depression, PTSD; 0 = *no*, 1 = *yes*), the offender-victim relationship and frequency of violent experiences (0 = *one time*, 1 = *multiple times*) was obtained from the files, accordingly. The offender-victim relationship was categorized into 1 = *stranger*, 2 = *extended connections (acquaintances, friends, counseling, care, treatment)* and 3 = *close connections ([ex-] partners and spouses, closest family, extended family)*.

The extent of the consequences of the injury was assessed using the GdS. It was rated at application by the leading medical officer based on psychiatric reports on a scale of 0–100. Higher values indicate more severe health damage.

In accordance with ICF-based measures for mental disorders (e.g. Mini-ICF-APP; Linden et al., 2015b), participation impairment was also rated across seven dimensions (leisure, interpersonal interaction, relationship skills, mobility, occupation, daily living, self-care) based on psychiatric file information. Overall participation was calculated as the mean of these dimensions (five-point scale from 1 = *no impairment* to 5 = *complete impairment*; interrater reliability: Cohen's $\kappa 1 = .72$, 95% CI [0.57, 0.86]; $\kappa 2 = .70$, 95% CI [0.54, 0.90]).

2.4. Statistical analysis

Data analysis was performed with IBM SPSS Statistics version 28, applying a significance level of $\alpha = .05$. Missing value analysis revealed > 5% missing values on various variables and logistic regression analyses indicated that missings did not occur completely at random. They were estimated using multiple imputation by fully conditional specification. 20 imputations were chosen following guidelines suggesting that $m \geq 20$ generally generates stable estimates and that the number of imputations should exceed the highest percentage of missing values among the predictor variables (maximum: 2.6%; Graham, 2007; Royston & White, 2011). In line with methodological recommendations, missing values on the dependent variable were not imputed; consequently, 13 cases with missing occupational status were excluded listwise, resulting in the final analytic sample of $N = 189$ adult victims.

To identify associations between characteristics of the crime, the victim, the victim-offender relationship, and occupational status after the offense non-parametric decision trees based on recursive partitioning via Chi-squared tests were used in SPSS (*Chi-squared Automatic Interaction Detector*, Exhaustive CHAID; IBM Corporation, 1989/2022). In Exhaustive CHAID, data is iteratively split into homogeneous subgroups with similar outcomes. At each step, the algorithm identifies the parameter showing the strongest association with the dependent variable. Decision trees were favoured over classical regression analysis as they do not rely on assumptions regarding distribution and allow interrelations between variables. CHAID also handles categorical predictors directly and automatically detects interactions. For substantive interpretability, tree depth was limited to four levels, with a minimum of 20 cases per split and at least seven cases required per terminal node. Additionally, exact binomial node-level 95% CIs for unemployment probabilities were calculated manually.

To complement decision tree analyses, selected correlations were examined descriptively regarding direction and strength of associations, as well as to enhance interpretability of results in regards to whether variables not selected as best predictors in the CHAID algorithm are nonetheless associated with work ability.

Exploratively, a McNemar test was applied to compare occupational status pre- and post-victimization, excluding victims of compulsory school age beforehand ($n = 48$) and with missing values ($n = 7$).

3. Results

3.1. Descriptives

3.1.1 Characteristics of the victims

Files of $N = 189$ adult victims were analysed (see Table 1 for details). The majority of victims were female (64.6%), with a mean age of 30.3 years ($SD = 19.06$, range = 0–79) at victimization. About 60% were single, divorced, or widowed.

At application, 50.3% were not employed, while 49.7% were employed; of those employed pre-victimization ($n = 97$), over one third (35) were not employed when applying.

3.1.2 Characteristics of the offenders and crime

In 152 cases (80.4%), the crime was committed by single offenders, and 92.1% of single or main offenders were male. Mean age at the time of the crime was 34.89 years ($SD = 13.72$, range = 12–76).

Approximately one third of offenders were unknown to the victims, 41.3% were a family member, an (ex-)partner or spouse (Table 2). In 32.0% of cases the victims experienced multiple acts of violence.

Physical (41.8%) and sexual violence (39.2%) were most frequently reported by victims. On average, 9.21 years ($SD = 14.66$; range = 0.01–62.56) elapsed between the crime and application for state compensation.

3.1.3 Consequences of the injury

161 victims (85.2%) had at least one psychiatric diagnosis at application (Table 3), most commonly PTSD

Table 1. Sociodemographic characteristics of the victims ($N = 189$).

Variables	*n* (%)
Sex	
Male	67 (35.4)
Female	122 (64.6)
Age at the time of the crime, grouped[a]	
0–20 years	61 (32.3)
21–40 years	69 (36.5)
41–60 years	45 (23.8)
61–80 years	13 (6.9)
Nationality[a]	
German	174 (92,1)
Other	14 (7.4)
Educational background[b]	
No professional qualification	39 (20.6)
Apprenticeship	114 (60.3)
University of Applied Sciences	5 (2.6)
University	10 (5.3)
Job status prior to the crime[c]	
Not employed	37 (19.6)
Employed	97 (51.3)
Of compulsory school age; minor inor	48 (25.4)
Job status at the time of application for state compensation	
Not employed	95 (50.3)
Employed	94 (49.7)
Marital status[d]	
Single	68 (36.0)
In a relationship	22 (11.6)
Married	48 (25.4)
Divorced	40 (21.2)
Widowed	6 (3.2)
	***M (SD)*; range**
Age at the time of the crime[a]	30.30 (19.06); 0–79
Age at the time of application	39.41 (14.83); 18–85

[a] Missing: $n = 1$ (0.5%). [b] Missing: $n = 21$ (11.1%). [c] Missing: $n = 7$ (3.7%). [d] Missing: $n = 5$ (2.6%).

(55.5%) and depressive disorders (23.3%). Women presented with significantly more diagnoses than men ($U = 2810.5$, $p < .001$). Suicidal ideation was documented for 22.2%, 10.1% attempted suicide.

78.3% of victims received psychiatric treatment, attendance at a trauma clinic was reported by 15.9% of the victims.

One third of the sample suffered from physical consequences of victimization. At application, the average GdS was 29.24 ($SD = 17.85$; range = 0-90), with female victims significantly more affected than males ($U = 2729.5$, $p < .001$). GdS also correlated negatively with work ability ($r = -.29$, $p < .001$).

Across participation domains, the highest impairment was found in occupational activities (3.29; $SD = 1.54$), and work-related ($\chi^2(4, N = 141) = 53.90$, $p < .001$) as well as overall impairment ($r = -.33$, $p < .001$) were negatively associated with work ability.

3.2. Predictors of the occupational status after the offense

Results of the decision tree analysis were consistent across all imputed datasets and showed three predictors of work ability (Figure 1). First, sex of the victim differentiated best between individuals ($\chi^2(1) = 10.54$, $p = .001$): Female victims had a 1.7-times higher risk of unemployment after the offense compared to men (59%, 95% CI [49.8–67.8] vs. 34.3%, 95% CI [23.2, 46.9]).

Second, within the subgroup of female victims, the diagnosis of a depressive disorder best predicted occupational status ($\chi^2(1) = 6.55$, $p = .010$): Women with a depressive disorder were about 1.5 times more likely to be unemployed than women without this diagnosis[1] (78.1%, 95% CI [60.0–90.7] vs. 52.2%, 95% CI [41.3, 62.9]).

Third, among male victims, the frequency of violent experiences differentiated occupational status best ($\chi^2(1) = 6.64$, $p = .010$): Multiple victimizations were associated with a 2.5-times higher risk of unemployment than single experiences (70.0%, 95% CI

Table 2. Descriptives of the offenders and the crime ($N = 189$).

Variables	*n* (%)
Frequency of violent experiences[a]	
One time	127 (67.2)
Multiple times	61 (32.3)
Act of violence experienced[h,i]	
Sexual abuse of children and adolescents	31 (16.4)
Sexual abuse of wards	19 (10.1)
Sexual coercion	20 (10.6)
Rape	30 (15.9)
Bodily harm	77 (40.7)
Physical abuse of wards	8 (4.2)
Impairment of health due to shock	2 (1.1)
Unlawful detention	4 (2.1)
Coercion / Threats	6 (3.2)
Emotional / psychological abuse	11 (5.8)
Other	73 (38.6)
Scene of the act of violence[b]	
Public	108 (57.1)
At home	78 (41.3)
Sex of the offender[c]	
Male	174 (92.1)
Female	8 (.2)
Nationality of the offender[d]	
German	119 (63.0)
Other	31 (16.4)
Number of the offenders[b]	
1	152 (80.4)
2	27 (14.3)
3 or more	7 (3.7)
Relationship to the offender[b]	
Stranger	62 (32.8)
Acquaintance	34 (18.0)
Friend	5 (2.6)
Partner / Spouse	7 (3.7)
Ex-Partner / Ex-Spouse	23 (12.2)
Closest family	32 (16.9)
Extended family	16 (8.5)
Consulting, care or treatment relationship	7 (3.7)
Filing of charges[a]	
No	26 (13.8)
Yes	162 (85.7)
Conviction of the offender[e]	
No	75 (39.7)
Yes	106 (56.1)
	***M (SD)*; range**
Age of the offender[f]	34.89 (13.72); 12–76
Time span between injury and application for state compensation[g]	9.21 (14.66); 0.01–62.56

[a] Missing: $n = 1$ (0.5%). [b] Missing: $n = 3$ (1.6%). [c] Missing: $n = 7$ (3.7%). [d] Missing: $n = 39$ (20.6%). [e] Missing: $n = 8$ (4.2%). [f] Missing: $n = 53$ (28.0%). [g] Missing: $n = 4$ (2.1%). [h] More than one option may apply to a person, so the percentages do not add up to 100. [i] Based on German Criminal Code.

Table 3. Descriptives of the consequences of the injury ($N = 189$).

Variables	*n* (%)
Physical consequences of the injury	
No	126 (66.7)
Yes	63 (33.3)
Psychiatric diagnosis at the time of application	
None	28 (14.8)
At least one	161 (85.2)
Type of psychiatric diagnosis[m]	
PTSD	104 (55.0)
Depressive disorder	44 (23.3)
Anxiety disorders (Social phobia, Generalized anxiety disorder, Panic disorder, Agoraphobia)	12 (6.3)
Somatoform disorders	5 (2.6)
Eating disorders	2 (1.1)
Sexual dysfunction	0 (0.0)
Personality disorders	12 (6.3)
Substance abuse / addiction	1 (0.5)
Physically not explainable symptoms	1 (0.5)
Other[n]	64 (33.9)
Suicidality[a]	
No suicidality	119 (63.0)
Suicidal thoughts / impulses / ideation	42 (22.2)
Suicide attempt	19 (10.1)
Self-harming behaviour (non-suicidal)[b]	
No	162 (85.7)
Yes	20 (10.6)
Treatment of the consequences of the injury[m]	
Somatic[c]	76 (40.2)
Psychiatric	148 (78.3)
Rehabilitation	52 (27.5)
Outpatient psychotherapy[d]	25 (13.2)
Visit of a trauma clinic	
No	159 (84.1)
Yes	30 (15.9)
	***M* (*SD*); range**
Extent of the consequences of the injury (GdS)[e]	29.24 (17.85); 0–90
Participation impairment	
Leisure[f]	2.39 (1.26); 1–5
Interpersonal interaction[g]	2.42 (1.10); 1–5
Relationship skills[h]	2.63 (1.18); 1–5
Mobility[i]	2.68 (1.21); 1–5
Occupation[f]	3.29 (1.54); 1–5
Daily living[j]	2.22 (1.13); 1–5
Self-care[k]	1.79 (1.01); 1–5
Overall[l]	2.49 (0.76); 1–4

Note: GdS = Grad der Schädigungsfolgen (English: Degree of the consequences of the injury).
[a] Missing: $n = 9$ (4.8%). [b] Missing: $n = 7$ (3.7%). [c] Missing: $n = 4$ (2.1%). [d] Missing: $n = 1$ (0.5%). [e] Missing: $n = 5$ (2.6%). [f] Missing: $n = 48$ (25.4%). [g] Missing: $n = 35$ (18.5%). [h] Missing: $n = 31$ (16.4%). [i] Missing: $n = 37$ (19.6%). [j] Missing: $n = 49$ (25.9%). [k] Missing: $n = 40$ (21.2%). [l] Missing: $n = 34$ (18.0). [m] More than one option may apply to a person, so the percentages do not add up to 100. [n] Diagnoses that could not be classified according to the International Statistical Classification of Diseases and Related Health Problems (ICD-10; WHO, 2016) or the Diagnostic and statistical manual of mental disorders (DSM-5; American Psychiatric Association, 2013) were grouped as 'Other'.

[34.8, 93.3] vs. 28.1%, 95% CI [17.0, 41.5]). However, this subgroup was very small (Node 3: $n = 10$), substantially limiting interpretability.

The overall misclassification risk of the decision tree was 0.37 ($SE = 0.04$). Confidence intervals for node-level unemployment rates were substantially wider for smaller nodes; therefore, interpretations primarily focus on larger nodes.

There was a significant change in occupational status from before to after victimization ($\chi^2(1, N = 134) = 17.36$, $p < .001$), with significantly more individuals losing employment ($n = 35$) compared to gaining employment ($n = 7$).

4. Discussion

The present study examined predictors of work ability among victims of severe IV applying a decision tree approach. Addressing the research questions, the analysis revealed a limited subset of literature-derived variables as relevant predictors of the occupational status after the offense. Sex constituted the primary split, followed by depressive disorder among female victims and frequency of violent experiences among male victims. Together, these strongest predictors jointly differentiated between employed and unemployed individuals within the structure of the decision tree.

4.1. Specifics of the sample

Our sample comprises particularly burdened victims: 39.2% reported sexual crimes, compared to 3.7% in the general population in 2020 (Landeskriminalamt Niedersachsen, 2022). About one third were exposed to multiple acts of IV. Approximately one fifth were aged 0–10 at victimization, around 32% were 20 years or younger. Trauma at a young age is associated with particularly severe consequences (Hillberg et al., 2011; Maniglio, 2009). Accordingly, about 85% of victims were diagnosed with at least one mental disorder, most commonly PTSD (>50%) and depressive disorders (>20%); 22% reported suicidal ideation, 10% attempted suicide. These findings contextualize the impairments in work ability of our sample.

4.2. Work ability

At application under the OEG, only half of the victims were able to work, and 36% of those employed pre-victimization were no longer employed. Moreover, work-related participation was most severely impaired of all dimensions of participation. Recent longitudinal research (Sumner et al., 2021) indicates that unemployment can negatively impact the course of posttraumatic psychopathology (PTS) itself, possibly due to the loss of key functions of employment, such as social support from colleagues (Bode et al., 2017), or trauma-specific factors like reduced access to support services resulting from unemployment (Ozer et al., 2003). Accordingly, unemployment was the most stable predictor of a chronic (vs. resilient) PTS trajectory across all symptom dimensions (Sumner et al., 2021). These findings underline the importance of prompt, low-threshold and work-focused services for victims of IV, as intended in the amended SER in Germany.

Regarding predictors of work ability in the present study, sex of the victim best differentiated between employment and unemployment, with female victims being 1.7 times less likely to work than men. While previous research suggested earlier RTW after CMD among women (Fisker et al., 2022), a large Canadian

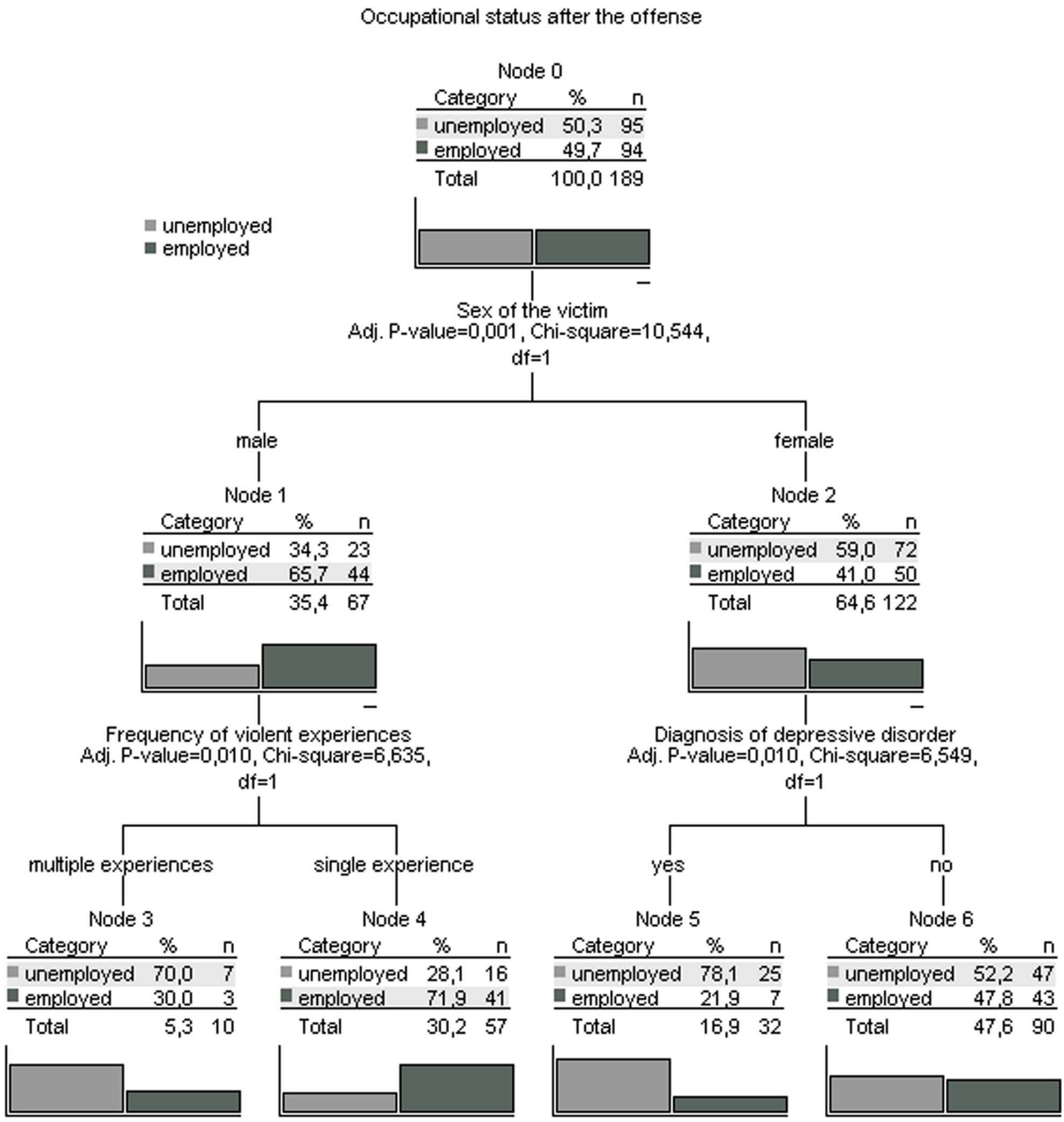

Figure 1. The occupational status after the offense in a non-parametric decision tree.

survey found reduced productivity and higher absenteeism and job loss among female than male victims of domestic violence (Wathen et al., 2015), which is arguably more comparable to our violence-exposed sample. Overall, victims of violence appear considerably more burdened than the average of individuals with CMD, particularly females. Similar to previous studies in this field (e.g. Franke et al., 2019; Wulfes et al., 2022), women constituted the majority of victims in our sample. Females are more frequently subjected to sexual violence, whereas men are more often victims of physical violence (Bundeskriminalamt [Federal Criminal Police Office], 2025). In our study, experiences of sexual violence were above 10 times more prevalent than in the general population, and also considerably higher than the average in victims of violence (Landeskriminalamt Niedersachsen, 2022). There is research suggesting that sexual violence may go along with more severe (psychological) impairments than physical violence (e.g. Chen et al., 2010). Consistently, women in the present sample showed a higher GdS and more mental disorders compared to men. These factors may contribute to our finding that the sex of the victim differentiated best regarding occupational status, stressing the importance of further studies examining the underlying interactions between variables predicting work ability (e.g. possible mediating or moderating effects).

Among female victims, the diagnosis of a depressive disorder best distinguished between employment

and unemployment. Such an effect was not found for male victims in exploratory analysis, possibly due to the relatively small subgroup size. Our finding aligns with research reporting that depressive symptom levels predicted RTW after physical trauma (both short and medium term; Tøien et al., 2012), whereas PTSD symptom severity did not. A similar association pattern between high depression scores and reduced likelihood of RTW across follow-up-assessments was observed in the large meta-analysis on CMD by Fisker et al. (2022); studies focusing specifically on PTSD were not included. Neither depression nor PTSD predicted overall impairment in another German OEG sample (Wulfes et al., 2022). However, other samples suggest that, while mostly both emerged as predictors of different dimensions of functioning (e.g. Pagotto et al., 2015), depression might exert a more thorough impact across functioning domains. Among American veterans, depression moderated the impact of PTSD on mental functioning; for high depression levels, comorbid PTSD made no further difference (Forchuk et al., 2020). Functioning, particularly overall and not specifically work-related, is a concept distinct from work ability. Still, occupational status predicted overall functioning in Wulfes et al. (2022), and we also found substantial correlations between the constructs (overall and work-related). Depressive symptoms, such as a reduced drive and energy, may have greater influence on (work-related) functioning and work ability than core PTSD symptoms, which might primarily affect other domains (e.g. relationship skills).

Some studies show an increased risk of mental disorders for repeated violent experiences (e.g. Howard et al., 2010). Despite close relationships, mental disorder, functioning and work ability are distinct and not necessarily predictable by the same factors. In our decision tree analysis, frequency of violent experiences emerged as the best predictor of work ability among male victims. We report this result with caution given the very small subgroup of multiply victimized men and the wide node-CI, thereby avoiding overinterpretation. Further work could address how the frequency of violence relates to work ability, taking gender into account.

The GdS was not identified as a primary predictor in our decision tree analysis but correlated with occupational status. The measure captures all functional impairments caused by the crime, so the relation to work ability is unsurprising. It seems to provide a good indication of the impact on work ability. In previous studies using OEG files (Franke et al., 2019) and physical trauma samples (Holtslag et al., 2007; Tøien et al., 2012), consequences of the injury were already shown to predict RTW and employment.

It should be emphasized that as our decision tree results are based on retrospective, file-based data, they reflect associations rather than causal relationships. Also, the design does not allow the identification or differentiation of mediators or moderators of work ability, and it does not permit inferences about the underlying mechanisms through which these factors influence occupational status. Accordingly, our findings may only be interpreted as an indication of the factors most strongly associated with work ability in victims of IV.

The age of the victim, presence of physical sequelae, and offender-victim relationship did not emerge as key predictors. These factors may have a greater impact on other dimensions of participation (e.g. interpersonal interaction or mobility), but also, differences in outcome definitions and samples likely play a role: Many studies focus on RTW relatively shortly after trauma, whereas on average, several years have passed until OEG application in our sample. The effects of higher age at victimization and physical sequelae on work ability may be overshadowed by persistent psychological impairments years later, which may have been influenced by the aforementioned factors earlier after victimization themselves. Furthermore, evidence for the impact of physical sequelae largely stems from studies on severe physical injuries (e.g. Holtslag et al., 2007). Although approximately one-third of the present sample also experienced physical consequences of victimization, the high prevalence of mental impairments may explain their secondary relevance. Also, the offender-victim relationship has been linked to the development of mental disorders (Kunst et al., 2010) and general participation impairments (Wulfes et al., 2022), suggesting that its association with employment may be mediated by mental health factors, rather than (solely) operating independently.

Adding to the file-based predictors, systemic factors unique to the German compensation framework may also influence work ability of victims. Late applications under the OEG may partly reflect its focus on compensating established damage, formally assessed via the GdS, rather than early intervention. At its core, the OEG followed the important aim of restoring participation in light of (long-term) victimization consequences, but it was not designed as an early support system. Combined with limited access to information and stigma-related barriers, this may have contributed to applications being filed when psychological burden and work-related impairments were already pronounced, particularly as work-focused rehabilitation was typically initiated at a late stage. The transition to the SER addressed some of these barriers by allowing low-threshold access to certain support services, particularly medical and psychotherapeutic care in trauma clinics, without final determination of the case and the GdS, thereby facilitating earlier support and potentially mitigating work-related impairments.

4.3. Strengths and limitations

The generalizability of our results is limited due to the selective sample of victims of severe IV applying for state compensation in Lower Saxony. Furthermore, the analysed files showed high qualitative differences, influencing the quality of our data. Often, standardized diagnostic interviews were lacking, so the diagnostic validity could be questioned. During file analysis, despite good interrater reliability, individual information processing and subjective assessment bases, especially for items with a lot of room for interpretation (e.g. 'humiliation' as a form of psychological violence), may have introduced bias. Likewise, there may have already been aggravation tendencies in the victims' statements, as entitlement to state compensation was based on the assessment of whether the injury consequences are attributable to the act of violence. Although occupational status is an objective measure, it does not specify qualitative aspects of work ability, e.g. part-time work or (partial) work disability, which were unavailable from the OEG files.

Unemployment may have resulted from factors unrelated to victimization in the time until application, which showed a high variation. Also, the reliance on file data prevented the control for pre-existing socio-economic status (e.g. household income or education level), which could be a confounder for current work ability. Still, the large proportion of victims only becoming unemployed after victimization points to fundamental links between victimization and subsequent unemployment.

Additionally, victims unemployed pre-victimization were included in our analysis (due to more than 20% of minor age beforehand). These aspects complicate comparisons to rates of work ability in literature.

Furthermore, the files lacked nuanced information on potentially relevant (pre-victimization) factors, especially prior mental disorders that may directly or indirectly influence work ability. Only the dichotomous presence of pre-existing mental health problems (yes/no) was available, without specification regarding types or number of diagnoses.[2] In future studies, a more thorough assessment of prior diagnoses could allow for the investigation of interactions with post-victimization psychological burden and, consequently, of an indirect effect on work ability, potentially informing targeted monitoring. Additionally, information on individual psychosocial resilience factors generally linked to work ability, such as RTW self-efficacy and coping strategies, was not available due to the file-based nature of our study.

Moreover, the files only contained information on sex, but not on gender of the victims; a more differentiated, gender-sensitive view of experiences of violence would be desirable.

Despite these limitations, decision tree analysis provides an innovative approach to examining hierarchical relations between predictors across different measurement levels. Also, the analysis of OEG files enabled us to gain valuable insight into a sample of victims of IV that has been scarcely studied regarding work ability. Therefore, despite limited generalizability, our findings provide important indications for the consequences of severe violence on work ability; they may contribute to a better understanding of victims' needs and tailored support.

In future research, prospective, longitudinal designs examining the course of work ability from victimization through (early) intervention, for instance, through the various stages of the compensation process in trauma clinics established under the SER, appear desirable. The present findings suggest that particular attention could be paid to female victims with depressive disorders, as their work ability was impaired most, which may in turn contribute to symptom progression. In studies with more complete data, ICF-based participation measures could provide a more differentiated understanding of work-related functioning. Finally, randomized intervention studies specifically evaluating the effectiveness of work-focused, trauma-informed measures (e.g. early occupational rehabilitation, graded RTW approaches, or workplace counseling) may help clarify how work-related outcomes can be improved.

5. Conclusions

Adding to their symptom burden, victims of severe IV are heavily impaired in their work ability. This is particularly worrying as unemployment entails detrimental effects, e.g. loss of social support, and possibly higher risk of chronic PTS trajectories. Also considering the high socioeconomic costs of violence (EIGE, 2021), the transition to the new SER in Germany offers an opportunity to address work-related impairments at an earlier stage via low-threshold, clearly regulated access to trauma clinics. Specific measures focusing on maintenance/early restoration of work ability could usefully complement these services. Our results suggest that female victims and victims with depressive disorders might be in particular need of the interventions and early monitoring, though prospective studies are necessary to reinforce this conclusion. To facilitate early support and referral, closer cooperation between police, medical institutions and victim protection organizations appears desirable. Future research should also examine the course of work ability and work-related functioning in relation to services received – for instance under the SER – to evaluate their effectiveness.

Notes

1. Exploratory Chi-squared analysis revealed no corresponding, significant difference in work ability between male victims with or without a depressive disorder. Descriptively, unemployment was also more common among depressive men (41.7% vs. 32.7%), but – likely due to the rather small male (depressive) subsample – this did not reach significance.
2. Explorative inclusion of this variable did not change the decision tree results, i.e., previous mental health problems were not the best predictor of work ability post-victimization on any level of the tree, nor were they correlated with it ($\varphi = -.09$, $p = .21$).

Author contributions

CRediT: **Lena Melzner:** Conceptualization, Data curation, Formal analysis, Methodology, Visualization, Writing – original draft, Writing – review & editing; **Alexandra Baumgärtner:** Conceptualization, Data curation, Formal analysis, Methodology, Visualization, Writing – original draft; **Astrid-Christine Mitschke:** Investigation, Resources; **Matthias Wehrmeyer:** Investigation, Resources; **Nele Wulfes:** Conceptualization, Formal analysis, Investigation, Writing – original draft, Writing – review & editing; **Christoph Kröger:** Conceptualization, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing.

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Data availability statement

Data are not publicly available due to privacy and ethical restrictions.

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