

Applicability of the post-traumatic stress disorder gate criterion in people with mild to moderate intellectual disabilities: Do additional adverse events impact current symptoms of Post Traumatic Stress Disorder in people with intellectual disabilities?

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Abstract

Background: Diagnostic manuals provide a strict definition of the PTSD gate criterion. Research on the adequacy of this definition in people with intellectual disabilities is lacking. This study aims to test the adequacy of the gate criterion for this population.

Method: Forty nine adults with mild to moderate intellectual disabilities and 43 caregivers were questioned. Traumatic events included in the gate criterion definition and adverse events going beyond it were assessed. It was tested whether adverse events affect symptoms of PTSD additionally to traumatic events.

Results: The current data showed ambiguous findings in self- and informant report. Informant data suggested an additional impact of adverse events on PTSD symptoms. Self-report data suggested the contrary.

Conclusion: Adverse events seem to have an impact on externalizing behavioural symptoms, such as hyperarousal. Self-report assessment of more specific, intrapsychic PTSD symptoms, such as intrusions and avoidance, should be addressed in future studies.

KEYWORDS

adverse events, gate criterion, intellectual disability, post-traumatic stress disorder

1 | BACKGROUND

The current study assesses the impact of traumatic and non-traumatic life events on symptoms of post-traumatic stress disorder (PTSD) in people with intellectual disabilities. Events covered by the definition of the gate criterion defined for PTSD in the current diagnostic manuals are referred to as *traumatic* events. Adverse life events with a stressful character that go beyond this definition are referred to as *adverse* events.

Recent evidence suggests that people with intellectual disabilities are at increased risk of exposure to traumatic and adverse events, especially interpersonal violence (Mevissen & de Jongh, 2010; Wigham & Emerson, 2015). Indeed, the risk of exposure to recent violence was found to be 1.6 times higher in adults with intellectual disabilities compared to non-disabled adults (Hughes et al., 2012) and 2.49 times higher for children with intellectual disabilities (McDonnell et al., 2019). It can be assumed that an interplay

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between individual, parental and environmental factors contributes to this increased vulnerability (McDonnell et al., 2019): intellectual disability goes along with a decreased ability to estimate risk and danger, such as understanding harmful motives of potential offenders (American Psychiatric Association, 2013; Greenspan, Switzky, & Woods, 2011; Hershkowitz, Lamb, & Horowitz, 2007). General living conditions of people with intellectual disabilities are characterized by common social determinants of poor health, such as poverty (Wigham & Emerson, 2015). Furthermore, they are more dependent on other people in daily life and often live and work in institutions, involving care situations with an elevated risk for exploitation (Catani & Sossalla, 2015; Strand, Benzein, & Saveman, 2004; Wigham & Emerson, 2015). Previous research has suggested that institutionalization is a major risk factor for exposure to violence (Carr, Duff, & Craddock, 2018; Lueger-Schuster et al., 2018).

A wide range of health and psychosocial problems or disorders can be traced back to traumatic and adverse events in the general population (Felitti et al., 1998; Gilbert et al., 2015). Of these disorders, PTSD is the only diagnosis that requires a specific traumatic event as a gate criterion, with the PTSD core symptoms being consequences of this event. Over the past forty years, a vast amount of research has examined the aetiology of PTSD in the general population (Brewin & Holmes, 2003). Among other relevant factors that influence the processing of traumatic events, such as social and interpersonal factors (Maercker & Horn, 2013), the role of memory consolidation has emerged as a key issue from these studies (Brewin, 2014; Ehlers & Clark, 2000). On the one hand, frequent and intense involuntary memories occur, consisting of trauma-related images, which often reach such a severity that the individual cannot distinguish the memory from an actual real-life experience. On the other hand, voluntary recall of the traumatic memory is often incomplete or not possible.

To be considered as a traumatic event that is sufficiently severe to trigger the PTSD core symptoms, the event serving as a gate criterion has to meet specific requirements defined by the diagnostic manuals, the Diagnostic and Statistical Manual of Mental Disorders (DSM; American Psychiatric Association, 2013) and the International Classification of Diseases (ICD; World Health Organization, 2018). The DSM-5 defines traumatic events as exposure to death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence, while the ICD-11 speaks of an "extremely threatening or horrific event or series of events" (World Health Organization, 2018). The definition of the gate criterion has been subject to multiple debates, one of which revolves around how broadly or narrowly the criterion should be defined, with some arguing in favour of abolishing the gate criterion altogether. Those in favour of such an amendment argue that the current definition puts too much aetiological weight on the stressor relative to vulnerability factors (Brewin, Lanius, Novac, Schnyder, & Galea, 2009). Opponents of abolishing or broadening of the gate criterion argue that it is necessary in order to capture the essence of a disorder defined by its "post-traumatic" character (McNally, 2009; Weathers & Keane, 2007; Weathers, Marx, Friedman, & Schnurr, 2014).

This discussion is particularly important for vulnerable populations such as people with intellectual disabilities. It has been repeatedly stated that the development of PTSD depends on individual risk factors (Friedman, 2013; Wigham & Emerson, 2015). Considering the relevance of memory, it is unsurprising that lower developmental and cognitive abilities have been established as risk factors for pathological processing of adverse events (Brewin, Andrews, & Valentine, 2000). Moreover, coping with adverse and traumatic life events is likely to be hampered in people with intellectual disabilities due to limited verbal capacities. This can lead to a limited capacity for disclosure and consequently a failure to receive specialized treatment and social support (Hershkowitz et al., 2007; Mevissen & de Jongh, 2010). Indeed, prevalence rates for PTSD have been shown to be towards the upper limit compared to the estimated prevalence in the general population (Daveney, Hassiotis, Katona, Matcham, & Sen, 2019). Apart from the elevated risk for trauma exposure, this might be traced back to elevated post-traumatic risk factors in processing traumatic events. Therefore, in the adapted DSM-5 criteria for PTSD in the Diagnostic Manual-Intellectual Disability (DM-ID 2), McCarthy, Blanco, Gaus, Razza, and Tomasulo (2017) propose a broadening of the gate criterion, suggesting that the threshold for traumatic events may be lower in people with intellectual disabilities. Indeed, this claim is supported by previous studies literature: experienced professionals and practitioners suggest that events going beyond the definition of the gate criterion, such as parental bereavement and having children removed, were common sources of trauma (Mitchell & Clegg, 2005). Moreover, expert raters considered such events as potentially traumatic for people with intellectual disabilities, especially events revolving around the broader themes of sexuality and autonomy (Rittmannsberger, Kocman, Weber, & Lueger-Schuster, 2019).

Research on the impact of adverse and traumatic events in people with intellectual disabilities is lacking. One reason for this is that research interest has only recently been directed towards this issue (Catani & Sossalla, 2015; Mevissen & de Jongh, 2010; Wigham, Taylor, & Hatton, 2014). Furthermore, research efforts have been hampered by a number of difficulties in terms of data collection, such as a limited accessibility to the sample and challenges in assessment (Daveney et al., 2019). The majority of studies on people with intellectual disabilities generally rely on information obtained from informants, while the need to include self-reports has been repeatedly emphasized (Finlay & Lyons, 2001; Mevissen, Didden, & de Jongh, 2016). In recent years, self-report assessment instruments have been developed and applied in several studies assessing the impact of traumatic events (Hall, Jobson, & Langdon, 2014; Hulbert-Williams, Hastings, Crowe, & Pemberton, 2011; Wigham, Hatton, & Taylor, 2011b). Hulbert-Williams et al. (2011) revealed a positive association between exposure to adverse life events and self-reported psychological problems. So far, only one study has demonstrated effects of recent adverse events on symptoms of PTSD while controlling for the effects of previous life events and pre-existing trauma symptoms (Wigham et al., 2014). However, no study to date has addressed the difference between

the impact of events defined as traumatic in current diagnostic manuals and adverse events that go beyond this definition. Such a distinction is crucial in order to understand the constitution of a traumatic event of highly adverse characteristic that is sufficiently stressful to trigger symptoms of PTSD in people with intellectual disabilities and thus to develop a differentiated understanding of the disorder in this population.

1.1 | Current study

The present study aimed to assess the adequacy of the gate criterion for people with mild to moderate intellectual disabilities. For this purpose, the present authors assessed the impact of adverse events over and above the impact of traumatic events on current symptoms of PTSD in people with mild to moderate intellectual disabilities. Traumatic events comprised experiences of interpersonal violence that are covered by the PTSD gate criterion (American Psychiatric Association, 2013; World Health Organization, 2018). Furthermore, emotional violence was included, since it has been shown to lead to PTSD in the general population (see Burns, Jackson, & Harding, 2010; Carr et al., 2018; Sullivan, Fehon, Andres-Hyman, Lipschitz, & Grilo, 2006). Adverse events comprised events that are not covered by the definition of the gate criterion (e.g., non-traumatic bereavement or a permanent change in caregivers), but were perceived as negative by the participants. The present authors examined the association of these events with current symptoms of PTSD using self-report and informant data in a sample of people with mild to moderate intellectual disabilities. The present authors expected adverse events to have an impact on PTSD over and above the impact of traumatic events.

2 | METHOD

2.1 | Participants

Fifty-four adults with mild to moderate intellectual disabilities were interviewed by trained clinical psychologists. Five people had to be excluded from the analysis due to difficulties in comprehension; thus, the final sample consisted of 49 persons (21 men and 28 women). Specific inclusion criteria were aged 18 years or over, a diagnosis of mild to moderate intellectual disabilities, and the capacity to give informed consent. Participants' mean age was 40.1 ($SD = 14$; range: 33.3–46.9 years) for men and 45.3 ($SD = 13.8$; range = 39.9–50.8 years) for women. The majority of the participants (79.6%) reported having grown up with their families, 14.3% with foster families and 6.1% in an institution. At the time of the study, 42.9% were in assisted living facilities, 22.4% lived independently, 22.4% lived with their family, 10.2% lived in an institution and 2% lived with a foster family. One missing value was replaced with the informant information. There were no significant discrepancies between participants' and informants' reports with regard to living arrangements.

For each participant, the present authors identified one caregiver or family member as an informant. In total, 43 informants completed the informant version of the assessment. Data from six informants could not be obtained. The majority of informants (92.7%) were paid caregivers, while one informant was a family member. Paid caregivers reported that they had known the participants for an average of 5.7 years ($SD = 6.2$), ranging from 0.5 to 25 years, and were in contact with them 3.9 ($SD = 1.5$) times per week on average, ranging from one to seven times a week. Data from one informant were missing.

2.2 | Measures

2.2.1 | Self-report measures

Data on biographical life events were collected using the *Bangor Life Events Schedule for Intellectual Disabilities: Self-Report* (BLESID-SR; Hulbert-Williams et al., 2011) and the German version of the *Maltreatment and Abuse Chronology of Exposure Scale* (KERF-20) (Isele et al., 2014).

Adverse events were assessed with the BLESID-SR, which comprises 24 life events divided into five sections: health, support and living arrangements, crime, occupational and financial, and relationships. The queried events cover typical life events in the lives of people with intellectual disabilities, such as changes in caregivers, or moving. Participants are asked whether these events have occurred in their lives and whether they perceived these events as positive, neutral or negative. This enables the calculation of a negative life event score, including only events negatively rated by the participants. The scale has shown good reliability, with Cronbach's $\alpha = .73$ (Wigham et al., 2014). The present authors assessed the occurrence of adverse life events throughout the lifespan, their frequency and their impact as rated by the participant.

The BLESID-SR does not include traumatic life events with a sensitive or taboo content (Hulbert-Williams et al., 2011). Events that could not be specifically assigned to either traumatic or adverse events, such as victim of theft, were excluded from the analysis. Traumatic life events were assessed using an adapted version of the KERF-20, an instrument originally designed to assess child abuse in the general population. The scale comprises sexual, physical and emotional violence, physical and emotional neglect, and witnessing of violence. Adaptations for the purpose of the current study included simplifying the wording and extending the queried period to the lifespan. Furthermore, the current study did not distinguish between perpetrators. Participants were asked which of the queried events they perceived as the worst event.

All measures, except for the KERF, were translated in a back-translation process involving the first author and a professional translator. After translation, the item formulation of the self-report measures was adapted for easy language in German and finalized together with a group of self-advocates. The third author, who significantly participated in the process of translation and simplifying

the self-report measures, has a long-standing experience in working with people with intellectual disabilities.

Current symptoms of PTSD were assessed using the *Lancaster and Northgate Trauma Scales for Intellectual Disabilities-Self-Report Version* (LANTS-SR; Wigham et al., 2011b), and the *Impact of Event Scale-Intellectual Disabilities* (IES-IDs; Hall et al., 2014).

The IES-IDs is an adaptation of the widely used *Impact of Event Scale-Revised* (IES-R; Weiss & Marmar, 1997) for people with intellectual disabilities. It comprises 22 questions assessing symptoms of PTSD according to DSM-IV. Currently, there are no adapted instruments available to assess DSM-5 PTSD in people with intellectual disabilities. The LANTS-SR comprises 29 questions assessing possible effects of traumatic events on people with intellectual disabilities. These effects go beyond those defined for the general population and include specific effects of traumatic events in people with intellectual disabilities. Where specific events were required in phrasing questions on symptoms, the general wording “bad experiences” was used if participants reported multiple stressful events. If there was a clear event stated as the worst one, this event was given as an example.

To avoid symptom overlap, the present authors deleted six questions from the LANTS-SR that had an identical content to the IES-IDs questions. The items that were deleted from the LANTS were replaced with the scores from the identical items of the IES-IDs for the data analysis. For example, the LANTS item “I want to smash things up” was replaced by the IES-IDs item: “Have you felt angry? (e.g., Have you wanted to smash or break things?). The LANTS item “I can keep my mind on things e.g. watching TV” has been replaced by the IES-IDs item “Have you found it hard to pay attention to the same thing? (e.g. Have you found it hard to watch the whole of a TV program?).” The LANTS-SR and the IES-IDs have demonstrated good reliability, with Cronbach's alphas of .89 for the LANTS-SR, between .90 and .91 for the total score of the IES-IDs, and between .61 and .88 for the subscales of the IES-IDs at two measurement points (Hall et al., 2014). In the present study, the psychometric properties were Cronbach's $\alpha = .84$ for the BLESID-SR, Cronbach's $\alpha = .63$ –.87 for the KERF subscales, Cronbach's $\alpha = .88$ for the LANTS-SR and Cronbach's $\alpha = .90$ for the IES-IDs. The physical violence subscale of the KERF had a Cronbach's α of .39. This scale was excluded from the analysis due to the low value of Cronbach's α .

2.2.2 | Informant measures

To assess participants' biography, the present authors used the informant version of the BLESID. The BLESID-I comprises 38 life events divided into the above-mentioned sections. It contains a wider range of events than the self-report version, including traumatic events such as sexual violence (Hulbert-Williams et al., 2014). PTSD was assessed using the informant version of the LANTS (LANTS-I), which comprises 43 questions on observable effects of trauma on people with intellectual disabilities on three

subscales: frequency, severity and behavioural changes (Wigham et al., 2011b). The latter measures changes in behaviour observed by informants after traumatic or adverse events. It was excluded from the analysis as the current study assessed the whole lifespan and thus in some cases events unknown to the informant. Both measures have previously shown good reliability, with the BLESID-I yielding a Cronbach's alpha of .87 (Wigham et al., 2014) and Cronbach's alphas of the LANTS-I ranging from .86 to .92 for each subscale at two different time points (Hall et al., 2014). In the current study, the psychometric properties were Cronbach's $\alpha = .74$ and .87, respectively, for the frequency and the severity subscale of the BLESID-I, and Cronbach's $\alpha = .93$ and .96 for the frequency and the severity subscale of the LANTS.

All measures were translated in a back-translation process involving the first author and a professional translator.

2.3 | Procedure

Ethical approval was obtained from the Ethics Committee of the University of Vienna (reference number: 00283; date of approval: 02 November 2017). Participants were approached in a top-down process and through snowball sampling. First, public institutions and an umbrella association for housing, work and advocacy of people with intellectual disabilities in Austria were contacted via e-mail. The study information indicated that the topic of the study was trauma in people with intellectual disabilities. A known traumatic biography was not a prerequisite for participation. A personal introduction and further presentation of the study to caregivers and potential participants was offered. Caregivers who work directly with people with intellectual disabilities selected potential participants. In some cases, participants were contacted directly, for example at a congress for self-advocates. Furthermore, data were collected in an institution for living and working for people with intellectual disabilities in Switzerland by the on-site clinical psychologist. Data collection took place from January to October 2018.

The questionnaire was completed during a face-to-face interview. All interviewers were licensed clinical psychologists. Participants were offered the possibility to take part in the interview together with a caregiver and were presented with a written informed consent form that was additionally read out by the interviewer. However, none of the current participants put this possibility to use. Adequate understanding was checked using an empirical assessment of capacity to consent (Wigham et al., 2014). If necessary, short psychological interventions were offered following the interview. Additionally, participants were provided with a list of specialized institutions (e.g., crisis lines or counselling centres) and a hotline run by the authors to call in the case of problems or further questions. Of the informant data, 67.4% were recorded in an interview with the authors and 32.6% of the informants completed the questionnaire on their own.

2.4 | Data analysis

Initial analyses were conducted to explore the associations between demographic data and exposure to adverse and traumatic events and symptoms of PTSD. To predict current symptoms of PTSD from self-report data, hierarchical multiple regression models were calculated. Considering the evidence on the impact of traumatic events on symptoms of PTSD, the present authors entered the mean scores of the KERF subscales into the model first. In a second step, the BLESID-SR negative life event mean score was entered into the model. Regressions were calculated for the IES-IDs and LANTS-SR mean score, respectively, as well as for the three IES-IDs subscales: intrusion, avoidance and hyperarousal. A further set of hierarchical regression models was calculated using the informant data. The mean score of adverse events assessed by the BLESID-I was entered into the model first. Second, the mean score of traumatic events assessed by the BLESID-I was entered into the model. Regressions were calculated separately for the two LANTS-I subscales.

3 | RESULTS

Participants reported a mean of 5.56 ($SD = 4.01$, range = 0–15) traumatic events in the KERF: an average of 1.00 ($SD = 1.26$; range = 0–3) for sexual violence, 1.42 ($SD = 1.29$; range = 0–3) for physical violence, 1.69 ($SD = 1.04$; range = 0–3) for emotional violence and 0.53 ($SD = 0.63$; range = 0–2) for witnessing of violence. Two participants reported no traumatic events in the KERF. On average, participants reported 12.56 ($SD = 3.35$; range = 5–19) significant events in the BLESID, 5.67 ($SD = 3.18$, range 1–14) of them negatively rated. Informants reported a mean of 12.33 life events ($SD = 5.89$; range = 2–34) in the BLESID-I, 6.1 of them negatively rated ($SD = 4.6$; range = 0–17) and 1.58 ($SD = 1.6$; range = 0–5) of them covered by the definition of the gate criterion. Participants reported a score of 48.59 ($SD = 14.93$; range = 26–77) in the LANTS and 40.45 ($SD = 11.55$; range = 20–62) in the IES-IDs: a score of 15.34 ($SD = 6.24$; range = 5–32) in the subscale intrusion, 13.13 ($SD = 4.66$; range = 1–25) in the subscale avoidance and 11.97 ($SD = 4.13$; range = 6–21) in the subscale hyperarousal.

Of the demographic variables, gender was significantly correlated with self-reported physical violence ($r = -.332$, $p < .05$) and sexual violence ($r = -.323$, $p < .05$), indicating higher rates in women. Gender was also significantly correlated with the mean scores of the LANTS-SR ($r = -.383$, $p < .05$) and the IES-IDs ($r = -.339$, $p < .05$), indicating higher rates in women. There were significant correlations between informant-reported age and symptom frequency ($r = .355$; $p < .05$). Furthermore, there was a significant association of self-reported current living arrangements with traumatic events ($R^2 = .258$, $F(4, 33) = 2.87$; $p < .05$) and adverse events ($R^2 = .255$, $F(4, 39) = 3.33$; $p < .05$). This analysis indicated that people who were living with their families reported less traumatic ($B = 3.00$; $p < .05$) and adverse ($B = 3.00$; $p < .05$) events than those living independently.

To test the hypothesis that adverse life events have an impact on current symptoms of PTSD over and above the effects of traumatic events, hierarchical multiple regression analysis was performed. Demographic variables that emerged as significantly correlated with any of the dependent or independent variables were entered into the model first. Traumatic events were entered next to the model, followed by adverse life events in the third step. Separate regression models were calculated for the following dependent variables: self-reported symptoms of PTSD measured with the LANTS and the IES-IDs, respectively, as well as the three IES-IDs subscales: intrusion, avoidance and hyperarousal. Furthermore, separate regression models were calculated for informant-rated PTSD symptoms measured with the LANTS subscales: severity and frequency. Tests for multicollinearity indicated that a low level of multicollinearity was present ($VIF = 1.09$ – 4.307 for self-report; $VIF = 1.000$ – 1.982 for informant report). An outlier diagnostic based on Cook's distance was conducted. Four cases emerged as influential and were therefore excluded from the analysis in the self-report condition and three cases in the informant condition (Darlington & Hayes, 2017).

A significant regression equation was found when predicting current symptoms of PTSD measured with the LANTS-SR in the second step of the model, with physical violence as a significant predictor. Entering adverse life events did not significantly improve prediction of the LANTS-SR mean score (see Table 1). Entering traumatic events in the regression model improved prediction of the IES-IDs mean score significantly. However, the overall regression equation remained non-significant. Only physical violence was a significant predictor of the IES-IDs mean score with a standardized coefficient of $\beta = .648$. Entering adverse events did not significantly improve prediction (see Table 2).

Furthermore, the IES-IDs subscales were examined separately. Traumatic events significantly predicted current symptoms of hyperarousal with physical violence as a significant predictor with a standardized coefficient of $\beta = .582$. Adding adverse events to the model yielded a significant increase in prediction (see Table 3). No significant regression equations for traumatic or adverse events overall were found predicting symptoms of intrusion and avoidance (see Tables 4 and 5). Physical violence emerged as a significant predictor for symptoms of intrusion (see Table 4), with a standardized coefficient of $\beta = .623$. There was an unexpected significant negative association between emotional violence and symptoms of avoidance (see Table 5) with a standardized coefficient of $\beta = -.604$.

A separate analysis with data obtained by informants was performed. To assess whether informant-reported adverse events predicted symptom severity and frequency measured by the LANTS-I, the present authors calculated hierarchical multiple regressions. When entering informant-rated traumatic events into the model, a significant regression equation in the first model was found, predicting both symptom frequency and severity. Witnessing of violence was a significant predictor for both outcome variables, emotional violence significantly predicted symptom severity. Entering adverse events into the model yielded a significant increase in explained variance of symptom frequency and severity (see Tables 6 and 7).

TABLE 1 Predictors of current symptoms of PTSD measured by the LANTS

	Model 1 B	Model 2 B	Model 3	
			B	95% CI
Constant	2.363	1.767	1.662	[0.925; 2.399]
Gender	-0.302	-0.061	-0.035	[-0.432; 0.361]
Family versus Institution	-0.297	-1.004	-0.986	[-1.713; -0.259]
Family versus Assisted Living	-0.057	-0.131	-0.123	[-0.469; 0.222]
Family versus Independently	0.259	-0.034	-0.069	[-0.499; 0.361]
Family versus Foster Family	-0.009	-0.936	-0.946	[-1.912; 0.021]
Sexual violence		-0.040	-0.046	[-0.188; 0.096]
Physical violence		0.335**	0.311**	[0.127; 0.495]
Emotional violence		-0.016	-0.032	[-0.194; 0.129]
Witnessing of violence		0.085	0.015	[-0.339; 0.369]
Emotional neglect		-0.413	-0.369	[-0.808; 0.071]
Adverse events			0.036	[-0.033; 0.105]
R^2	.177	.556**	.574**	
F	1.46	3.635**	3.424**	
ΔR^2		.379**	.017	
ΔF		4.96**	1.14	

Notes: $N = 45$; CI, confidence interval.

* $p < .05$.

** $p < .01$.

4 | DISCUSSION

The findings of the current study show that adverse events had an impact on some current symptoms of PTSD over and above the effects of traumatic life events. These results suggest that a broader range of events has to be taken into account when considering the conceptualization of PTSD in people with mild to moderate intellectual disabilities.

4.1 | Main findings

Knowledge on the constitution of the gate criterion in the population with intellectual disabilities is lacking. Some authors argue that due to a higher vulnerability in terms of processing traumatic events, a broader range of events than currently defined by the gate criterion may lead to PTSD in this population (McCarthy et al., 2017). The current results varied between the two self-report measures of current symptoms of trauma sequelae: self-reported traumatic events had a significant impact on current symptoms of PTSD measured by the LANTS, but not the IES-IDs. Adverse events had no additional impact on PTSD symptoms. In contrast, the results from the informant data indicate a significant additional impact of adverse events on PTSD over and above the effect of traumatic events on symptom frequency and severity. Self-reported data indicate an effect of a different subset of events on PTSD compared to informant data:

surprisingly, self-reported emotional violence was negatively associated with symptoms of PTSD measured with the IES-IDs, while data from informant report indicate the contrary. Furthermore, while self-reported data suggest that physical violence plays a major role in the development of symptoms of PTSD, informant data suggest that witnessing of violence has a greater relevance.

4.2 | Conceptualization of PTSD in people with intellectual disabilities

A discrepancy emerged in the results from the two currently available self-report measures for PTSD in people with intellectual disabilities. Notably, six items were identical in both measures. Self-reported traumatic events had a significant impact on current symptoms measured by the LANTS, but not the IES-IDs. Interestingly, hyperarousal was the only subscale of the IES-IDs that was significantly associated with traumatic events. These discrepant findings might be best explained by the difference in the conceptualization of the two instruments. While the IES-IDs assesses DSM-IV PTSD symptoms defined for the general population, the LANTS-SR additionally comprises specific effects in people with intellectual disabilities that go beyond these symptoms: stereotypical behaviours, challenging behaviour and reduced self-care, as well as additional symptoms derived from interviews and surveys with service users, carers, advocates and staff (Wigham

	Model 1 B	Model 2 B	Model 3	
			B	95% CI
Constant	2.556	1.819	1.594	[0.542; 2.645]
Gender	-0.427	-0.052	0.001	[-0.565; 0.567]
Family versus Institution	-0.383	-1.084*	-1.036	[-2.073; 0.001]
Family versus Assisted Living	-0.063	-0.098	-0.101	[-0.602; 0.4]
Family versus Independently	-0.020	-0.305	-0.393	[-1.008; 0.222]
Family versus Foster Family	0.117	-0.729	-0.729	[-2.110; 0.652]
Sexual violence		0.018	0.009	[-0.195; 0.212]
Physical violence		0.390**	0.335*	[0.073; 0.598]
Emotional violence		-0.131	-0.174	[-0.407; 0.059]
Witnessing of violence		0.056	-0.131	[-0.655; 0.394]
Emotional neglect		-0.449	-0.329	[-0.962; 0.305]
Adverse events			0.085	[-0.016; 0.187]
R ²	.117	.402	.461	
F	0.87	1.885	2.103	
ΔR^2		.286*	.059	
ΔF		2.678*	2.964	

Note: N = 45; CI, confidence interval.

* $p < .05$.

** $p < .01$.

TABLE 2 Predictors of current symptoms of PTSD measured by the IES-IDs

	Model 1 B	Model 2 B	Model 3	
			B	95% CI
Constant	2.962	2.069	1.828	[0.702; 2.954]
Gender	-0.554*	-0.226	-0.169	[-0.775; 0.437]
Family versus Institution	-0.764	-1.748**	-1.696**	[-2.807; -0.586]
Family versus Assisted Living	-0.308	-0.319	-0.322	[-0.858; 0.215]
Family versus Independently	-0.161	-0.526	-0.620	[-1.279; 0.039]
Family versus Foster Family	0.313	-0.859	-0.860	[-2.339; 0.619]
Sexual violence		-0.009	-0.019	[-0.237; 0.199]
Physical violence		0.411**	0.353**	[0.071; 0.634]
Emotional violence		-0.024	-0.069	[-0.318; 0.18]
Witnessing of violence		0.246	0.046	[-0.516; 0.608]
Emotional neglect		-0.593	-0.465	[-1.143; 0.214]
Adverse events			0.092	[-0.017; 0.201]
R ²	.163	.501*	.55*	
F	1.284	2.806*	3.000*	
ΔR^2		.338*	.049	
ΔF		3.786*	2.97	

Note: N = 45, CI, confidence interval.

* $p < .05$.

** $p < .01$.

TABLE 3 Predictors of current symptoms of hyperarousal measured by the IES-IDs

TABLE 4 Predictors of current symptoms of intrusion measured by the IES-IDs

	Model 1 B	Model 2 B	Model 3	
			B	95% CI
Constant	2.519	1.728	1.489	[-0.056; 3.033]
Gender	-0.411	0.028	0.060	[-0.776; 0.896]
Family versus Institution	0.025	-0.783	-0.710	[-2.236; 0.816]
Family versus Assisted Living	0.118	0.067	0.085	[-0.659; 0.829]
Family versus Independently	-0.033	-0.368	-0.438	[-1.343; 0.468]
Family versus Foster Family	-0.073	-1.205	-1.197	[-3.219; 0.825]
Sexual violence		-0.042	-0.061	[-0.367; 0.244]
Physical violence		0.49*	0.434*	[0.049; 0.819]
Emotional violence		-0.188	-0.217	[-0.565; 0.132]
Witnessing of violence		0.138	-0.068	[-0.851; 0.715]
Emotional neglect		-0.824	-0.703	[-1.631; 0.225]
Adverse events			0.090	[-0.065; 0.245]
R^2	.063	.335	.37	
F	0.431	1.363	1.387	
ΔR^2		.272	.034	
ΔF		2.213	1.414	

Note: $N = 45$, CI = confidence interval.

** $p < .01$.

* $p < .05$.

TABLE 5 Predictors of current symptoms of avoidance measured by the IES-IDs

	Model 1 B	Model 2 B	Model 3	
			B	95% CI
Constant	2.133	1.503	1.493	[0.217; 2.769]
Gender	-0.309	0.289	0.289	[-0.447; 1.025]
Family versus Institution	-0.357	-0.494	-0.490	[-1.625; 0.646]
Family versus Assisted Living	0.056	0.043	0.044	[-0.507; 0.594]
Family versus Independently	0.348	0.171	0.167	[-0.528; 0.862]
Family versus Foster Family	0.235	0.359	0.361	[-1.108; 1.83]
Sexual violence		0.224	0.223	[-0.016; 0.462]
Physical violence		0.241	0.237	[-0.121; 0.596]
Emotional violence		-0.372*	-0.373*	[-0.666; 0.08]
Witnessing of violence		-0.297	-0.305	[-0.888; 0.278]
Emotional neglect		0.143	0.150	[-0.549; 0.849]
Adverse events			0.004	[-0.118; 0.126]
R^2	.156	.413	.413	
F	1.000	1.549	1.345	
ΔR^2		.257	.00	
ΔF		1.927	0.005	

Note: $N = 45$, CI, confidence interval.

** $p < .01$.

* $p < .05$.

	Model 1 B	Model 2 B	Model 3	
			B	95% CI
Constant	1.312	1.078	0.982	[0.784; 1.18]
Age	0.008*	0.003	0.003	[-0.002; 0.007]
Sexual violence		0.182	0.066	[-0.199; 0.331]
Physical violence		0.201	0.174	[-0.080; 0.427]
Emotional violence		0.329*	0.271*	[0.027; 0.515]
Witnessing of violence		0.312*	0.119**	[-0.131; 0.37]
Adverse events			0.049	[0.017; 0.08]
R ²	.143	.707***	.801***	
F	4.488	11.099***	14.739***	
ΔR ²		.564***	.094**	
ΔF		11.077***	10.358**	

Note: N = 40. CI, confidence interval.

**p* < .05.

***p* < .01.

****p* < .001.

TABLE 6 Predictors of informant-rated I-LANTS frequency subscale

	Model 1 B	Model 2 B	Model 3	
			B	95% CI
Constant	0.284	0.034	-0.072	[-0.281; 0.138]
Age	0.006	0.001	0.000	[-0.004; 0.005]
Sexual violence		0.293	0.166	[-0.114; 0.446]
Physical violence		0.119	0.089	[-0.179; 0.357]
Emotional violence		0.303*	0.239	[-0.020; 0.497]
Witnessing of violence		0.465**	0.253	[-0.012; 0.518]
Adverse events			0.054**	[0.021; 0.087]
R ²	.082	.635***	.802***	
F	2.411	10.735***	14.821***	
ΔR ²		.618***	.102**	
ΔF		11.847***	11.273**	

Note: N = 40. CI, confidence interval.

**p* < .05.

***p* < .01.

****p* < .001.

TABLE 7 Predictors of informant-rated I-LANTS severity subscale

et al., 2011b). Based on the current study, the conceptualizations of the LANTS seem to represent reactions to traumatic events in people with intellectual disabilities better. This might be attributed to the broader conceptualization of the LANTS. Therefore, it is surprising that adverse events did not account for a significant additional variance in symptoms measured by the LANTS. The current findings might imply that the DSM-IV conceptualization does not sufficiently represent the reaction to traumatic events in people with mild to moderate intellectual disabilities.

Notably, of the DSM-IV subscales, only the hyperarousal subscale was significantly associated with traumatic events. This is in line with previous literature that states that externalizing behaviours, such as hyperarousal, are more easily identified in people with intellectual disabilities than intrusion and avoidance (Kildahl, Bakken, Iversen, & Helverschou, 2019). A preponderance of behavioural symptoms in the manifestation of PTSD in people with intellectual disabilities has repeatedly been pointed out in literature (Bakken et al., 2014; Mevissen et al., 2016; Wigham, Hatton, & Taylor, 2011a).

Behavioural symptoms may occur as an expression of or reaction to intrusion symptoms, or as a response to an inability to avoid triggers due to a lack of autonomy (Wigham & Emerson, 2015). People with intellectual disabilities might lack the skills to understand these symptoms and therefore have trouble verbalizing them or recognizing them from an interviewer's description (Rittmannsberger et al., 2019). The current possibilities for verbal self-report assessment seem to be insufficient to gain adequate insight into these symptoms in people with intellectual disabilities.

4.3 | Distinctiveness of self-and informant report

Informant data suggest an additional impact of adverse events on current PTSD symptoms that is contrary to the self-report data. One possible explanation for this discrepancy is that symptoms assessed with informants focus more on observable externalizing behaviours (Hall et al., 2014; Mileviciute & Hartley, 2015). These symptoms seem to better depict the impact of adverse events on people with mild to moderate intellectual disabilities. The current result from self-reported symptoms of hyperarousal further underlines this interpretation, since the impact of adverse event in this subscale is higher compared to the other subscales. Another possible explanation for the discrepancy between self- and informant report are the different measures used to assess the biography of traumatic and adverse events.

4.4 | Impact of different forms of violence

Surprisingly, the current study found no impact of self- or informant-reported sexual violence on current symptoms of PTSD and even a negative, although non-significant, association between self-reported emotional violence and PTSD symptoms measured with the IES-IDs. This unexpected association was significant only for the PTSD subscale avoidance. These findings are in contrast to the current state of evidence in the general population (Carr et al., 2018) and in the intellectual disability population (Wigham et al., 2011a), and are also contrary to the current results retrieved from informant data. Interestingly, this unexpected negative association was significant for self-reported symptoms of avoidance. One possible explanation might be that self-reported data are biased by emotional numbing and avoidance of feelings related to the trauma (American Psychiatric Association, 2013). Another possible explanation is that the current study did not distinguish between perpetrators, in order to make the questionnaire feasible. Considering risk factors for victimization in the lives of people with intellectual disabilities, a range of different perpetrators can be expected. Therefore, the sexual and emotional violence assessed in the current study was quite heterogeneous and comprises events of violence more or less stressful (e.g. violence through primary caregivers or parents compared to violence through colleagues with intellectual disabilities in sheltered workshops). Another possible explanation is that

recognizing emotional violence may be more challenging for people with intellectual disabilities. Finally, the relatively small sample size may partly explain this result, as may the adaptations and translations of the measures that have not been tested for validity.

4.5 | Associations with demographic data

In the current sample, women experienced significantly higher rates of physical and sexual violence, which is in line with previous literature on gender differences in exposure to interpersonal violence in the general population (Tolin & Foa, 2006). Higher rates of sexual violence in females are also consistent with findings from the population with intellectual disabilities (Gil-Llario, Morell-Mengual, Ballester-Arnal, & Díaz-Rodríguez, 2018; Soylu, Alpaslan, Ayaz, Esenyel, & Oruç, 2013). This also explains the higher symptomatology reported by women in the LANTS. Furthermore, people who were currently living independently reported more traumatic and adverse events than those living in families, but did not report higher current symptoms of PTSD. One possible explanation for this result is that training to be independent may provide people with the skills to cope with adverse life events. Another explanation might be that people who were more able to cope with traumatic and adverse events were more likely to move into independency. Furthermore, the present authors found a significant association between age and informant-reported symptom frequency. A possible explanation for this finding is an increase of PTSD symptoms due to decreasing cognitive abilities with age (Lapp, Agbokou, & Ferreri, 2011).

4.6 | Study strength

The current study contributes to our understanding of trauma sequelae in people with mild to moderate intellectual disabilities. Data on exposure to adverse and traumatic life events as well as PTSD were collected from two different sources, including self-report with people with intellectual disabilities. This is the first study to apply a German translation of measures for PTSD in people with mild to moderate intellectual disabilities.

4.7 | Limitations

Major limitations of this study are the small sample size and the sample bias resulting from the participant recruitment process, as participants were pre-selected by their caregivers and participated voluntarily. This renders the findings less generalizable to the population of people with mild to moderate intellectual disabilities. Furthermore, adapting and simplifying assessment instruments can certainly be considered a limitation and the applied measures have not been validated in German. The lack of significant relationships of exposure to adverse and traumatic events and self-reported symptoms of intrusion and avoidance might be an indicator that

the wording of these questions is not yet sufficiently developed. This also applies to the simplification of the KERF, for example lack of differentiating between perpetrators. This certainly led to a loss of information on the severity of trauma exposure. Furthermore, the double items of the LANTS and the IES-IDs have been deleted in the interest of study economy and feasibility. Moreover, the IES-IDs is based on DSM-IV symptom structure due to a lack of assessment instruments based on current diagnostic manuals. Moreover, only one informant was used per participant. Finally, the analyses are based on retrospective information. Despite these limitations, the current findings provide clear directions for further research and important implications for clinical practice.

4.8 | Research implications

This study is the first to assess the impact of adverse events over and above the impact of traumatic events on PTSD symptoms in people with mild to moderate intellectual disabilities. The conclusions from self- and informant-reported data are discrepant. Informant data suggest that adverse events should be taken into account when considering the trauma sequelae for this population. However, it is not yet clear whether adverse events trigger symptoms distinctive of PTSD (Kildahl et al., 2019). A better understanding of intrapsychic PTSD symptoms and a further development of their assessment will be a challenge for future research. Therefore, investigating the factor structure of PTSD in the intellectual disability population is an important step. Considering the actuality of this field, future studies should focus on the adequacy of DSM-5 and ICD-11 PTSD and complex PTSD (CPTSD) in people with intellectual disabilities. Furthermore, to the best of our knowledge, there are no published findings on the underlying factor structure of the LANTS. This is an important issue for future research, especially since some of the symptoms added to the LANTS over and above PTSD core symptoms are reminiscent of the disturbances in self-organization of CPTSD (World Health Organization, 2018).

4.9 | Clinical implications

The findings of this work highlight the importance of behaviour as an expression of trauma sequelae in people with mild to moderate intellectual disabilities. This has important implications for improving clinical practice. It is crucial to provide training for caregivers to enable them to recognize the potential traumatic aetiology of behavioural symptoms. Addressing the cause of behaviours in a conversation with the person can provide a starting point for explorations into and understanding of the traumatic aetiology of these symptoms. Our findings suggest that it is feasible to communicate with people with mild to moderate intellectual disabilities about traumatic events. Treating traumatic events as taboo (Hulbert-Williams et al., 2011) is not in line with contemporary scientific and ethical standards and prevents people with intellectual disabilities from

accessing evidence-based treatment methods for PTSD, for which an exposure to the traumatic event is crucial.

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CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

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