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## Original article

## Not recognized enough: The effects and associations of trauma and intellectual disability in severely mentally ill outpatients

Jeanet Grietje Nieuwenhuis, Hedwig Johanna Henrica Smits, Eric Onno Noorthoorn\*, Cornelis Lambert Mulder, Engelbertus Johannes Maria Penterman, Henk Llewellyn Inge Nijman

GGnet, Zutphen, 7531, PA, Netherlands

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## ABSTRACT

*Background:* Little is known about the association between trauma and intellectual disability in SMI patients.

*Aim:* To establish the prevalence of trauma and its association with intellectual functioning in SMI outpatients.

*Methods:* A cross-sectional study was conducted in two mental health trusts in the Netherlands. We used the Trauma Screening Questionnaire (TSQ) to screen for trauma and PTSD, and the Screener for Intelligence and Learning disabilities (SCIL) for suspected MID/BIF. Chi-square and *t*-tests were used to test differences in outcome over patient characteristics. Post-hoc analysis was used to investigate gender differences between patients with and without MID/BIF on trauma and sexual trauma.

*Results:* Any trauma was found in 86% of 570 patients and 42% were suspected for PTSD. The SCIL suggested that 40% had Borderline Intellectual Functioning (BIF), half of whom were suspected of having Mild Intellectual Disability (MID). These patients had more traumatic experiences (1.89 in BIF, 1.75 in MID, against 1.41 in SCIL-negative patients). Female MID/BIF patients (61%) had experienced significantly more sexual abuse than male MID/BIF patients (23%).

*Conclusions:* Significantly more SMI outpatients who screened positive for MID/BIF reported having experienced traumatic events than those who screened negative. Rates of all trauma categories were significantly higher in the screen-positive group, who were also more likely to have PTSD. Sexual abuse occurred more in all females but the SCIL positive women are even more often victim. Clinical practice has to pay more attention to all of these issues, especially when they occur together in a single patient.

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### 1. Introduction

Patients with severe mental illness (SMI) have often experienced traumatic events during their lifetime. In a review on SMI, Mauritz et al. [1] reported prevalence rates of 47% for physical abuse, 37% for sexual abuse and 30% for PTSD. In the general population these prevalence's are 21%, 23%, and 7%, respectively [1,2]. This review concluded that physical neglect, emotional abuse and neglect, and complex PTSD were all highly prevalent problems that had barely been examined in patients with SMI and may be overlooked in treatment [1,3]. In a representative sample of 2181 people interviewed by telephone in Florida, Breslau et al. [4] concluded that the lifetime prevalence of exposure to any

trauma in the general US population was 89.6%. In the study by de Bont et al. [3], trauma exposure was reported to be 78.2% of the 2608 SMI patients with psychotic disorders. This study showed one subgroup of SMI patients – those with an intellectual disability – were even at greater risk for trauma. As our sample concerns SMI patients with or without MID/BIF we may expect similar findings.

In a recent study [5], we found on the basis of the Screener Intelligence Learning Disabilities (SCIL) that 43.8% of SMI patients admitted were suspected of MID/BIF. To our knowledge, there have been no studies on trauma or PTSD in SMI patients with MID/BIF. Only one study [6], in a sample of mostly first onset patients, showed that PTSD was nearly twice as common in MID patients (19.7%) and BIF patients (19.6%) than in those with no intellectual disability (10.4%). Intellectual disability can be divided into Mild Intellectual Disability (MID: IQ 50–70) and Borderline Intellectual Functioning (BIF: IQ 70–85). Apart from the IQ, also problems in

\* Corresponding author.

E-mail address: [e.noorthoorn@ggnet.nl](mailto:e.noorthoorn@ggnet.nl) (E.O. Noorthoorn).

adaptive functioning need to be taken into account, when setting the diagnosis according to the DSM-5 criteria.

The clinical relevance of the distinction between MID and BIF was illustrated in the studies of Nouwens et al., who identified 5 patient profiles [7] and showed most unmet needs occurred in the BIF patients [8]. From clinical practice, underlined by these studies, we know that especially BIF as a diagnosis may be missed, because of the streetwise presentation and lowbrow appearance of patients with BIF, while these patients often lack sufficient coping strategies to deal with hassles in daily life. High levels of stress caused by these daily life problems are often an obstacle to profit from treatment. Patients with BIF may profit from the regular treatment if adapted in pace and language. Patients with MID need more treatment adjustments.

There is widespread violence, sexual and physical abuse against adult people with MID [9], and some studies have shown that non-SMI people with MID are particularly at risk for sexual violence and abuse [10,11]. A study by Lan-Ping et al. [12] showed an increased rate of sexual assault among people with all kinds of disabilities, but especially in those with an intellectual disability. Over half the reported sexual assaults were reported in the intellectually disabled, against one third in those with chronic psychosis. Finally, a review [13] showed that the prevalence of PTSD in people with MID ranged from 2.5% to 60%, due possibly to the use of a wide variety of instruments and to their low psychometric quality. We therefore wished to establish the prevalence of trauma and PTSD in SMI patients who were either or not suspected of MID/BIF. Because the literature looks primarily into MID patients, we wanted to know whether the MID showed more trauma or PTSD than the BIF/MID group [13]. For clinical practice, better empirical knowledge on the prevalence of PTSD in BIF or MID may contribute to improved diagnosis and treatment. The current study is an effort to provide empirical findings from a naturalistic sample of SMI patients treated in the community.

## 2. Methods

### 2.1. Settings and design

A cross-sectional study was conducted in SMI patients in four Flexible Assertive Community Treatment teams (FACT) in the eastern Netherlands (FACT teams North and South in Apeldoorn), and in the southern Netherlands (in Uden and Veghel). FACT teams are multidisciplinary outpatient teams with 8–10 clinicians (psychiatrist, psychologist, nurses and social workers), each usually treating about 200 SMI patients [14]. The screening was done by the clinicians of the FACT teams asking their patients to fill out the self-report questionnaires described later, after informing them about the study. SMI patients were defined as having had one or more psychiatric disorder (psychosis, depression, personality, bipolar or several other disorders), combined with social-functioning problems, for at least two years [15,16].

### 2.2. Patients

Over a period of approximately two years from the end of 2015 until June 2017, all patients in the four FACT teams were screened for trauma and MID/BIF. Patients were excluded on the basis of (1) an inadequate grasp of the Dutch language, (2) uncooperativeness, (3) an inability, in the assessor's opinion, to concentrate for at least 20 min for purposes of engaging in the test as outlined in the instruction.

### 2.3. Measures

#### 2.3.1. Trauma screening using the TSQ

PTSD comprises three symptom groups: re-experiencing, avoidance and hyperarousal. The Trauma Screening Questionnaire

(TSQ) is a screener for Post-Traumatic Stress Disorder that consists of a 10-item symptom screening tool derived from the 17-item PTSD Symptom Scale [17]. The TSQ items are answered by “yes” (symptom has been present for two weeks), or “no” (symptom is not present); the minimum score is zero, and the maximum score is 10. The items reflect the way patients themselves interpret the questions, without predefined criteria. Sensitivity and specificity of the TSQ varied between 85 and 98%, depending on the severity of trauma and pre-existing psychiatric morbidity [17,18]. The reliability of the TSQ as expressed in Cronbach's alpha was good (0.85) [3]. The TSQ cut-off score for having PTSD was found to be 6, which, in a study in psychotic patients, showed a sensitivity of 78.8%, and a specificity of 75.6%, with 44.5% correct positives and 93.6% correct negatives [3]. The lower figure of correct positives can be explained by the relatively low prevalence of PTSD diagnosis [18] and the complexity to de-entangle the symptoms of psychosis and trauma in psychotic SMI patients. While in that study the TSQ was validated in psychotic SMI patients [3], it was not validated in patients with MID, maybe leading to some underreporting as patients with MID may not understand the questions or the symptoms stated due to their disability.

#### 2.3.2. MID/BIF screening using the SCIL

The SCIL is a test consisting of 14 questions and small tasks that are intended to provide overall insight into a patient's cognitive abilities [19,20]. It was developed specifically to detect MID/BIF (IQ 50–85) or suspected MID/BIF in people in a range of settings, such healthcare or social-service settings, and also police stations and homelessness. The SCIL was validated in an adult sample by comparing the scores obtained with test results obtained by the WAIS [20]. The reliability of the SCIL as expressed in Cronbach's alpha was good (0.83 in 318 adult subjects). The AUC-value was 0.93, which is excellent. With 19 or lower as a Cut-off score, the SCIL accurately classified 82% of people with MID/BIF. Of the 10 people without MID/BIF, 9 (89%) were classified correctly as having no MID/BIF [20]. According to the SCIL manual, administering the SCIL requires no specific clinical skills [19]. Before administering it, the participating nurses received two hours of training, after which they first assessed 8 patients under supervision before performing assessments on their own. We used the following cutoff scores: above 19 for no MID/BIF (SCIL negative); below 19 for MID/BIF (SCIL positive); and 15 and below for MID.

#### 2.3.3. Chart information

Basic demographic data such as age, gender and psychiatric diagnosis (DSM-IV-TR) were extracted from routine hospital information in digital medical charts. This information was added to the database containing the questionnaire findings.

### 2.4. Analyses

Differences in patient compilation and scoring on these questionnaires were compared and tested using one-sided or two-sided chi-square, or two-sided t-tests when appropriate. In all comparisons we investigated possible selection bias by comparing patient compilation in non-assessed patients, SCIL-positive patients and SCIL-negative patients. As the purpose of these analyses is to seek confirmation of findings in former studies in MID/BIF, we used 1-sided chi square when testing our assumptions on the associations between trauma and MID/BIF. For continuous variables such as age and number of traumas, we used the student *t*-test. We also performed a post hoc analysis on the differences regarding sexual trauma between men and women as well as within women respectively men over the various subgroups.

### 3. Results

#### 3.1. Sample

The flowchart (Fig. 1) presents the response on the SCIL and the TSQ. Specifically, 565 patients (69%) were assessed using the SCIL, and 570 (69%) filled out the TSQ. SCIL interviews had not taken place in 24 cases, as patients had left care before they were able to concentrate for above 20 min. Fifteen patients were excluded due to the severe anxiety or psychotic symptoms that were apparent during interview (5); due to their poor grasp of Dutch (4); and due to illiteracy (3), acquired brain disorder (2), and severe autism (1). In total, 39 were excluded, 162 (19%) refused, 137 (16%) were assessed using one of the questionnaires, and 499 (60%) were assessed using both. This accounts for the disparities in numbers in the various tables.

#### 3.2. Patient characteristics within SCIL groups

Table 1 shows that 40% of outpatients were suspected of MID/BIF and 20% were suspected of MID. The GAF score of the non-response group (no SCIL, mean 38.7) was lower than that of the group assessed by the SCIL (46.6,  $t = 6.01$ ,  $p < 0.01$ ), suggesting that mental illness was more severe in the non-response group.

With respect to diagnosis, we found neither selective non-response nor any significant differences between the SCIL-positive and SCIL-negative patients. The only significant difference was the diagnosis of higher intellectual disability as a primary or secondary diagnosis in significantly more SCIL-positive patients (30.1% vs. 6.6%,  $OR = 5.91$ ,  $p < 0.001$ ). Beside this obvious finding, SCIL-positive patients had a greater number of clinical diagnoses in only one disorder: Adjustment Disorder (10.7% vs. 5.9%,  $OR = 1.90$ ,  $p < 0.05$ ). In the patients with a SCIL below 15, schizophrenia occurred more (37.8% vs. 26.4%  $OR = 1.69$ ,  $P < 0.05$  and Personality Disorder occurred less (17.8 vs. 28.3,  $OR = 0.55$ ,  $p < 0.05$ ). The clinically relevant cut-off

score on the GAF (i.e., below 45) did not arise more frequently in the drop-out group (43% vs 51%,  $\chi$ -square = 0.19).

#### 3.3. Trauma

As Table 2 shows, the prevalence of any trauma found using the TSQ in all subsamples (SCIL positive, SCIL negative and no SCIL) was nearly the same, with percentages between 80% and 90%. The number of traumas, however, was 1.49 in the no SCIL group against 1.89 in the SCIL-positive and 1.41 in the SCIL-negative groups. In patients with a SCIL below 15, a mean of 1.75 traumas was observed. All these differences were significant. Analysis of trauma categories showed significant differences between the SCIL-positive and the SCIL-negative patients. Neglect was more prevalent in the SCIL-positive patients (57.1%) than in the SCIL-negative patients (45.3%), followed by physical trauma in 50.9%, sexual trauma in 43.9% and disaster in 37.9%. Physical trauma, neglect and disaster had occurred significantly more in the SCIL-positive group. We noted less sexual trauma in the “no SCIL” group.

For none of the TSQ items does Table 3 show a difference between patients with MID and without MID. This lack of difference may have been due to the relatively small sample of MID patients, a suspicion that was confirmed by the relatively low odds ratios and relatively large confidence intervals. We observed that 43.2% of all patients assessed with the TSQ had over six 6 trauma symptoms, which implies a possible PTSD. As Table 3 shows, most PTSD symptoms occurred significantly more in the SCIL-positive patients, with the exception of bodily reactions when reminded of the trauma, and of being startled by something unexpected. Only for heightened awareness of danger was the odds ratio reasonable (1.82; 1.26–2.61). The prevalence of a TSQ-score of 6 and higher (i.e., being suspected of having a PTSD), differed significantly between the groups ( $OR = 1.48$ ,  $p < 0.05$ , one-sided), with 43.2% in all patients, 37.6% in the SCIL-negative patients and 47.8 in the SCIL-positive patients.

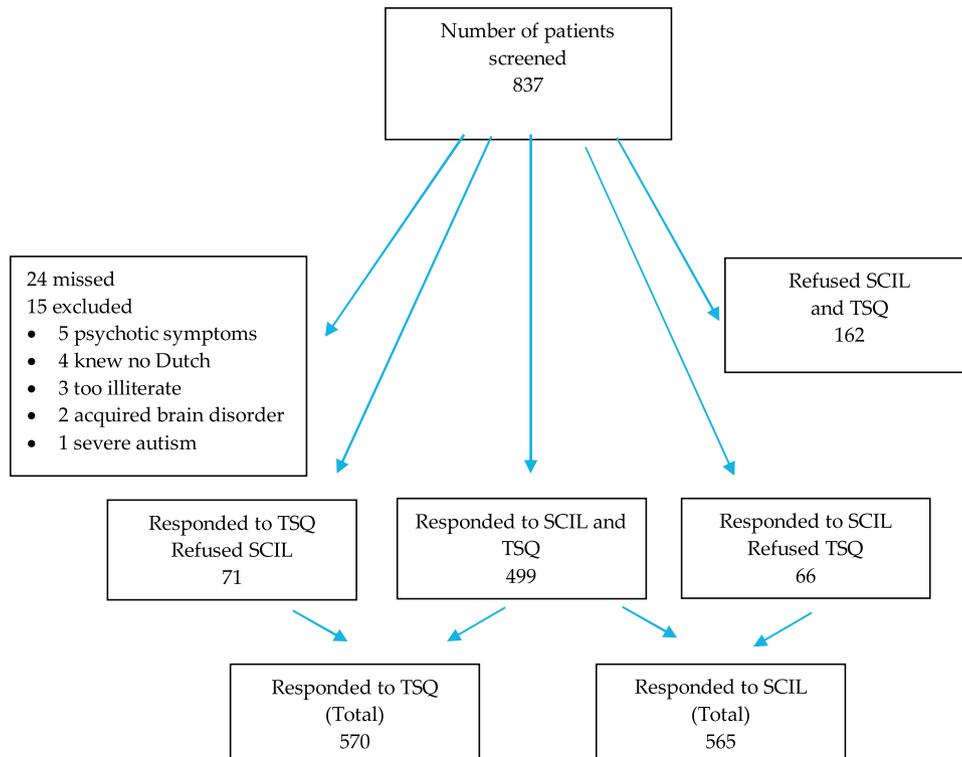


Fig. 1. Flow chart.

**Table 1**  
Comparisons between patients with no SCIL, patients with scores above and below 19 (Borderline Intellectual Functioning and Mild Intellectual Disability) and above and below 15 (Mild Intellectual Disability).

	Below Borderline Intellectual Functioning/Mild Intellectual Disability				Mild Intellectual Disability				
	% No SCIL	% SCIL negative (>19)	% SCIL Positive (≤19)	SCIL positive/SCIL negative		% SCIL > 15	% SCIL ≤ 15	SCIL ≤ 15/SCIL > 15	
				OR	95% CI OR			OR	95% CI OR
N	272	340	225			474	91		
Age (mean)	45.96	46.06	47.76			46.63	47.32		
Gender <sup>*</sup>									
Male	62.1	44.1	43.8	1.18	0.85–1.66	47.0	42.9	1.18	0.75–1.86
Female	37.9	51.9	56.2			53.0	57.1		
Diagnosis									
Adjustment disorder <sup>*,a</sup>	5.5	5.9	10.7	1.90	1.02–3.54	8.2	5.6	0.66	0.25–1.71
Depression <sup>*,b</sup>	8.5	13.3	12.0	0.89	0.53–1.48	13.9	6.7	0.44	0.18–1.05
PTSD diagnosis	8.1	6.5	10.7	1.72	0.94–3.15	8.2	7.8	0.94	0.41–2.17
Bipolar disorder	5.1	9.7	9.3	0.95	0.54–1.69	9.9	7.8	0.76	0.34–1.75
Psychotic disorders	12.5	14.5	15.1	1.05	0.66–1.69	14.1	17.6	1.31	0.72–2.39
Schizophrenia <sup>*,b</sup>	21.3	27.7	28.9	1.05	0.73–1.54	26.4	37.8	1.69	1.06–2.72
Developmental disorder	11.0	9.4	5.8	0.58	0.30–1.15	8.0	7.8	0.97	0.42–2.24
Drug-abuse disorder	5.9	4.4	6.2	1.43	0.68–3.03	4.9	6.7	1.40	0.55–3.54
Personality disorder <sup>b</sup>	22.1	26.8	26.2	0.96	0.66–1.42	28.3	17.8	0.55	0.31–0.98
Intellectual disability <sup>*,a,b</sup>	12.1	6.6	30.1	5.91	3.55–9.84	11.8	38.5	4.66	2.81–7.73
GAF score <sup>*</sup>	38.7	46.9	46.2	0.94	0.71–1.29	46.9	46.1	0.90	0.55–1.50

<sup>\*</sup> Significant difference between no SCIL, SCIL positive and SCIL negative (BIF)  $p < 0.05$ , one-sided chi-square.

<sup>a</sup> Significant difference between SCIL positive and SCIL negative (BIF)  $p < 0.05$  one-sided chi-square.

<sup>b</sup> Significant difference between SCIL below 15 and above 15 (MID)  $p < 0.05$  one-sided chi-square.

**Table 2**  
Trauma in patients with a SCIL score above or below 19 (BIF/MID) and above or below 15 (MID).

	Borderline Intellectual Functioning and Mild Intellectual Disability					Mild Intellectual Disability				
	% all	% No SCIL	% SCIL negative (>19)	% SCIL positive (≤19)	SCIL positive/SCIL negative		% SCIL > 15	% SCIL ≤ 15	SCIL ≤ 15/SCIL > 15	
					OR	95% CI OR			OR	95% CI OR
N=	570	71	287	212			414	85		
Any trauma	85.1	88.4	84.0	86.8	1.25	0.75–2.08	85.0	85.9	1.07	0.55–2.09
Number of trauma experiences <sup>*,a,b</sup>	1.60	1.49	1.41	1.89			1.58	1.75		
Sexual trauma <sup>a</sup>	39.7	27.0	36.5	43.9	1.36	0.95–1.95	39.8	38.8	0.96	0.59–1.55
Physical trauma <sup>a</sup>	42.0	41.9	35.1	50.9	1.92	1.33–2.76	40.5	48.2	1.37	0.86–2.19
Neglect <sup>a</sup>	50.4	44.7	45.3	57.1	1.60	1.12–2.92	49.0	56.5	1.34	0.84–2.16
Experienced disaster <sup>a</sup>	30.0	30.4	24.0	37.9	1.93	1.31–2.86	29.5	31.8	1.11	0.67–1.84

<sup>\*</sup> Significant difference between no SCIL, SCIL positive and SCIL negative (BIF)  $p < 0.05$ , one-sided chi-square.

<sup>a</sup> Significant difference between SCIL positive and SCIL negative (BIF)  $p < 0.05$ , one-sided chi-square, or student *t*-test.

<sup>b</sup> Significant difference between SCIL below 15 and above 15 (MID)  $p < 0.05$ , one-sided chi-square, or student *t*-test.

### 3.4. Post hoc analysis

Table 4 presents the analysis stratified by gender, and shows some interesting differences with regard to gender and to SCIL-positive and SCIL-negative patients. In the men, there were no differences regarding any trauma or sexual trauma. In women, however, there was a slight but significant difference showing more any trauma (OR 2.01) in the SCIL-positive patients. More importantly, in SCIL-positive and SCIL-negative patients, stratified analysis showed an odds ratio above 1 between men and women. The odds were greater in the SCIL-positive patients (5.4) than the SCIL-negative patients (3.8). This implies that women had more trauma than men, but also that this difference was greater in the SCIL-positive patients than in the SCIL-negative ones. We also observe a trend in the prevalence of sexual trauma in SCIL-positive women, but not in SCIL-negative women (60.7 vs 51.4 OR = 1.46  $\chi$ -square 2.8  $p = 0.062$ ). Comparison of scores above and below 15 showed no significant differences.

## 4. Discussion

The main objective of this study was to establish the prevalence of trauma in SMI patients with and without MID/BIF. We found that

85.1% of these SMI outpatients had experienced one or more traumatic event; 43.2% of patients in the current sample were suspected of PTSD, with over six symptoms. Neglect and physical trauma were the commonest. Disaster or accident trauma were less frequent, while sexual trauma occurred primarily in women.

In the group of patients suspected of having MID/BIF, as many as 47.8% were screen-positive for PTSD, compared to 37.6% in the non-MID/BIF group. Analysis of the kinds of abuse we report in our study shows nearly the same outcome as shown in the review of Mauritz et al. [1]. Most kinds of trauma are reported significantly more in the SCIL-positive group (Table 2). Remarkably, the number of PTSD diagnoses (8.1%) was far lower than the number of patients suspected of PTSD as assessed by the TSQ, even after taking account of a corrective positive prediction of 44.5% [3]. This implies that most PTSD diagnoses had not been documented in the patients files. The PTSD prevalence in MID/BIF patients reported in a review article by Mevissen and de Jong [13] ranged between 2.5 and 60%. The prevalence we found thus lies in the upper range found in the review. As the TSQ is not validated in MID/BIF patients, it is conceivable that patients with a low score on the SCIL either do not properly understand what they have been asked, or, due to their disability, do not recognize their symptoms. If so, this may have led to underreporting of PTSD symptoms in the SCIL-positive

**Table 3**

Trauma Symptoms in patients with a SCIL score above or below 19 (BIF/MID) and above or below 15 (MID).

	% all	% No SCIL	Borderline Intellectual Functioning and Mild Intellectual Disability			Mild Intellectual Disability				
			% SCIL negative (>19)	% SCIL positive (≤19)	SCIL positive/SCIL negative		% SCIL > 15	% SCIL ≤ 15	SCIL < 15/ SCIL > 15	
					OR	95% CI OR			OR	95% CI OR
Trauma symptoms		71	287	212			414	85		
Thoughts or memories against will <sup>a</sup>	40.6	33.7	42.9	1.48	1.03–2.14	37.3	38.8	1.07	0.66–1.71	
Upsetting dreams <sup>a</sup>	46.4	37.6	49.8	1.64	1.14–2.35	42.6	43.5	1.04	0.65–1.66	
Feeling as if the event is recurring <sup>a</sup>	42.0	29.3	36.8	1.41	0.97–2.06	32.0	34.5	1.12	0.68–1.83	
Feeling upset by reminders of the event <sup>a</sup>	58.0	47.2	57.8	1.53	1.07–2.19	50.7	56.5	1.26	0.79–2.02	
Bodily reaction when reminded	36.2	37.5	37.4	0.98	0.69–1.44	38.4	32.9	0.78	0.48–1.29	
Difficulty falling or staying asleep	44.9	42.0	48.8	1.32	0.92–1.88	44.0	49.4	1.24	0.78–1.99	
Irritability <sup>a</sup>	41.2	35.1	42.5	1.37	0.95–1.97	38.5	37.2	0.95	0.59–1.53	
Difficulties concentrating <sup>a</sup>	27.0	36.9	44.3	1.36	0.95–1.95	40.1	40.0	0.99	0.62–1.60	
Heightened awareness of danger <sup>a</sup>	44.9	36.4	50.9	1.82	1.26–2.61	41.4	48.2	1.32	0.83–2.11	
Startled after something unexpected <sup>a</sup>	11.2	28.5	36.4	1.44	0.99–2.09	31.0	36.0	1.26	0.77–2.04	
Above six symptoms <sup>a</sup>	43.2	40.6	37.6	1.48	1.03–2.12	40.6	47.1	1.30	0.81–2.08	

<sup>b</sup> Significant difference between SCIL below 15 and above 15 (MID)  $p < 0.05$ , one-sided chi-square.

<sup>c</sup> Significant difference between no SCIL, SCIL positive and SCIL negative (BIF)  $p < 0.05$ , one-sided chi-square.

<sup>a</sup> Significant difference between SCIL positive and SCIL negative (BIF)  $p < 0.05$ , one-sided chi-square.

**Table 4**

Any trauma and sexual trauma in patients with a score above or below 19 (BIF/MID) and above or below 15 (MID).

		Borderline Intellectual Functioning/Mild Intellectual Disability				Mild Intellectual Disability				
		% No SCIL	% SCIL negative (>19)	% SCIL Positive (<19)	SCIL positive/SCIL negative		% SCIL > 15	% SCIL < 15	SCIL positive/SCIL negative	
					OR	95% CI OR			OR	95% CI OR
Men	N=	71	287	212			414	85		
	N=	39	143	95			202	36		
	Any trauma	75.0	83.9	80.0	0.77	0.39–1.50	83.7	75.0	0.59	0.25–1.36
	Sexual trauma	7.0	21.5	23.2	1.09	0.59–2.04	22.7	19.4	0.82	0.34–2.00
Women	N=	30	144	117			202	36		
	Any trauma <sup>a,c</sup>	96.7	84.0	91.4	2.01 <sup>e</sup>	1.01–5.14	86.3	93.9	2.43	0.71–8.33
	Sexual trauma <sup>c,d</sup>	54.8	51.4	60.7	1.46	0.89–2.39	56.1	53.1	0.88	0.47–1.64

<sup>c</sup> Significant difference between no SCIL, SCIL positive (BIF, below 19) and SCIL negative  $p < 0.05$ , one-sided chi-square.

<sup>b</sup> Significant difference between SCIL below 15 and above 15 (MID)  $p < 0.05$ , one-sided chi-square.

<sup>a</sup> Significant difference between SCIL positive (BIF, below 19) and SCIL negative  $p < 0.05$ , one-sided chi-square.

<sup>c</sup> Significant difference between men and women on SCIL positive, below 19 (BIF)  $p < 0.05$ , one-sided chi-square.

<sup>d</sup> Significant difference between men and women on SCIL below 15 (MID)  $p < 0.05$ , one-sided chi-square.

<sup>e</sup> OR = (106/121) / (10/23) = 2.0149.

group. Another reason of lack of difference between the MID group and the group above 15 on the TSQ may have been due to the relatively small sample of MID patients, a suspicion that was confirmed by the relatively low odds ratios and relatively large confidence intervals.

Our findings are in line with both these studies. As expected, sexual trauma had occurred more in women, especially in the SCIL-positive (MID/BIF) group. More detailed examination of the gender differences in sexual trauma showed a significant difference between men (23.2%) and women (60.7%) in the SCIL-positive group, and also a significant difference between men and women on SCIL below 15 (19.4%–53.1%). Women with BIF/MID are thus victims more often than men with BIF/MID. According to our finding, gender is more important in becoming a victim of sexual trauma. With regard to sexual trauma, the study by Murphy and O’Callaghan [21] showed that adults with MID were significantly less knowledgeable about almost all aspects of sex, having difficulty in distinguishing abusive relationships from consenting relationships. So this may even be an underestimation.

Our finding of more physical abuse in the SCIL-positive group is also in line with the literature on MID patients. In the study by Catani and Sossella [22], physical and emotional child abuse were positively correlated with general traumatic events in adulthood.

Childhood sexual abuse was related to the experience of intimate partner violence in adult life. Physical abuse, such as being badly beaten, was reported by a large number of participants (44.6%). At 50.9%, our findings of physical trauma are even higher than those reported by Catani and Sossella.

#### 4.1. Clinical implications

If we are to explain patients’ underreporting of trauma and PTSD in SMI—including, to some extent, that by professionals—several factors should be considered. First, we know that many SMI patients present with a myriad of complaints that are initially hard to disentangle. For example, dissociation and psychotic symptoms can be signs not only of PTSD, but also of schizophrenia. Comorbidity – such as substance abuse and depression, sexually aberrant behavior or sexual problems – and somatic symptoms are often present. Another explanation may be that, out of fear of aggravating symptoms and causing a crisis, professionals hesitate to pay attention to past traumatic experiences. In this way, PTSD often seems to have been overlooked and left untreated [13].

Second, we need to keep in mind that using screeners remains an approximation of the clinical diagnosis. Especially in PTSD, the

clinician may come to a different conclusions than interview based assessments [23,24]. Some authors dispute the validity of assessing PTSD in patients with psychosis [25].

Third, we know from the study by Mueser et al. [26] that PTSD in patients with SMI is associated with more severe symptoms, re-traumatization, worse functioning, and difficulties with interpersonal relationships. PTSD itself negatively affects the course of SMI. The study by McNeill et al. [27] also showed that patients with PTSD in SMI have increased avoidance coping which leads to significant psychological distress and a more highly taxed psychiatric state. After stressful events, those with SMI and PTSD are at greater risk of engaging in life-endangering behaviors, and are at greater danger of attempting suicide than those with SMI alone [28]. We found no literature on trauma and PTSD in SMI MID/BIF patients that also examined the subjects of wellbeing or mental state. As this may explain limited symptomatic recovery, it is relevant to future research.

Finally, as we know from the literature on PTSD in patients with MID, the PTSD can present in different ways and be difficult to recognize. Flashbacks are sometimes falsely communicated as current experiences, and thus diagnosed as schizophrenia [29]. Whigham et al. [30] noted that, after trauma, MID patients can communicate reactions in various way, either behaviorally (such as in challenging behavior or acting out); through changes in physical health; or through changes or loss in daily skills. The authors also noted that the symptoms of trauma are mediated by the patients' developmental level. It is already known that people with MID/BIF tend to react with behavior and coping styles that resemble a borderline personality disorder.

All these variations in clinical presentation may thus confuse or impair interpretation of the TSQ findings in MID or BIF patients. Without adequate assessment and treatment, PTSD will lead to chronic and serious psychiatric problems, lower quality of life, and higher treatment costs. Despite initial criticism, SMI trauma treatment using Eye Movement Desensitisation Reprocessing (EMDR) and Cognitive Behavioural Treatment (CBT) in SMI patients has proven to be successful [31], even in patients with psychotic symptoms [32,33]. Case studies suggest positive treatment effects in PTSD for various treatment methods [34] in SMI. Both EMDR and CBT were proven effective in patients with MID [35]. These methods may therefore be effective in MID/BIF SMI patients. It is therefore very important for those in clinical practice to distinguish between patients with intellectual shortcomings and those without, and to pay full attention to all categories of trauma.

#### 4.2. Strengths and limitations

One strength of the current study is that it covers consecutive data in a number of FACT teams over various centers. As the number of included patients was substantial, the results may be generalized to SMI patients as a whole. Apart from a slightly lower GAF scores, there were no indicators of any selective response. An important limitation of the current study is that the MID subgroup was quite small. Some of the subgroup analysis concerned small numbers and may be investigated in future studies.

#### 4.3. Recommendations for clinical practice and research

Given the great impact of MID/BIF, trauma and PTSD on the course of Serious Mental Illness, we recommend that all patients who meet the SMI criteria are screened as early as possible in the treatment. The SCIL and the TSQ are both validated questionnaires that are short and easy to use [3,17,19,20]. If the outcome of these screening instruments is known, we recommend that PTSD is diagnosed using an appropriate questionnaire that takes account

of the cognitive level of functioning. In people with MID, this may mean following the comprehensive guide to PTSD 2016 [35]. For those with MID/BIF, it may mean using validated instruments, or, where necessary and possible, referral to a specialized center for patients with SMI and MID/BIF. In the last few years, various screening instruments for PTSD in patients with MID/BIF have been validated, such as the LANTS (Lancaster and Northgate Trauma Scales) by Wigham et al. [36], and the IES-IDs (Impact of Event Scale – Intellectual Disabilities) by Hall et al. [37].

To minimize the number of potential blind spots regarding trauma, PTSD and intellectual functioning, we also recommend the following: If a patient's medical chart does not already contain relevant information on childhood or the past—particularly with regard to development, school career, family and social circumstances, and safety in relationships—it should always be collected.

#### Acknowledgements and ethical considerations

We thank M Hanif for her contribution in performing assessments. This study was drafted on the basis of the STROBE Guidelines [38]. All procedures in the current study were performed in accordance with the ethical standards of the Ethics Committee at the regional hospital in Enschede, the Netherlands, as obtained in 2014; and with the 1964 Helsinki declaration and its later amendments and comparable ethical standards. Data analysis was performed on fully anonymized data which could in no case be used to identify an individual. Medical-ethical approval for the study was provided by the ethical board at the University of Twente, Enschede, the Netherlands. For this study no funding was applied.

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