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Urs Hepp · Alex Gamma · Gabriella Milos · Dominique Eich · Vladeta Ajdacic-Gross ·
Wulf Rössler · Jules Angst · Ulrich Schnyder

Prevalence of exposure to potentially traumatic events and PTSD The Zurich Cohort Study

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Abstract *Objective* The aim of this study was to estimate the prevalence rate of exposure to potentially traumatic events (PTE) and posttraumatic stress disorder (PTSD) in a representative sample of the general population. *Method* A representative community-based cohort from the canton of Zurich, Switzerland was interviewed in 1993 and 1999 at the age of 34/35 and 40/41 years, respectively, by means of a semi-structured diagnostic interview. *Results* The weighted lifetime prevalence of PTE in 1999 was 28%. Of the persons who reported exposure to PTE (criterion A), none met all the remaining criteria for PTSD according to the DSM-IV. Eleven persons (2 males and 9 females) met the criteria for subthreshold PTSD. This corresponds to a weighted 12-month prevalence for subthreshold PTSD of 1.30% (0.26% for males; 2.21% for females). In 1993, no participant met all criteria for PTSD according to the DSM-III-R. The weighted 12-month prevalence for subthreshold PTSD was 1.90% (2.9% for males; 0.9% for females). *Conclusion* The prevalence of exposure to PTE in Switzerland was relatively low. No single case of full PTSD was found in the sample, and even for subthreshold PTSD the prevalence was very low. The relatively stable socio-economic and political climate in Switzerland may contribute to a sense of safeness, which may protect Swiss citizens to some extent from developing PTSD in the aftermath of traumatic experiences.

Key words epidemiology · posttraumatic stress disorder · prevalence

Introduction

Posttraumatic stress disorder (PTSD) is a severe and often chronic disorder following traumatic events [28]. Pathologic stress responses to trauma exposure have long been identified [27], but systematic research on posttraumatic stress increased with the inclusion of the diagnosis of PTSD in the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) in 1980 [2]. As PTSD in DSM-III was defined by the development of characteristic symptoms following exposure to an extreme traumatic stressor, subsequent research on the psychological sequelae focused mainly on populations at risk such as combat veterans [12, 32], and victims of natural disasters [42], criminal and sexual assault [9, 11]. As a consequence of the changes in the stressor criterion in the DSM-IV [1], research on PTSD was extended to a broader spectrum of potentially traumatic events (PTE), such as motor vehicle accidents [10, 41]. PTSD has become a major health concern, making epidemiologic data on the prevalence in the community increasingly important.

Epidemiological studies on PTSD in the general population are scarce. To date, most studies come from the USA and Canada [13, 18, 25, 28, 29, 39, 44] yielding lifetime prevalence rates ranging from less than 1% [25] up to about 10% [13, 28]. Higher prevalence rates have been reported for post-conflict regions [19]. In Europe, there have been two representative surveys: one in a sample of 14- to 24-year-olds [38, 43] revealing a relatively low prevalence of PTSD as compared to the National Comorbidity Survey [28], although the design of the study was comparable. The other study was performed in older adults [48]. To date, for Europe, no epidemiological data on PTSD in adults in the general population exist. An overview of PTSD prevalence rates derived from community-based surveys is presented in Table 1.

A. Gamma · D. Eich · V. Ajdacic-Gross · W. Rössler · J. Angst
Psychiatric University Hospital Zurich
Lenggstrasse 31
8029 Zurich, Switzerland

Dr. med. U. Hepp (✉) · G. Milos · U. Schnyder
Department of Psychiatry
University Hospital
Culmannstrasse 8
8091 Zurich, Switzerland
Tel.: +41-44/255-5280
Fax: +41-44/255-4408
E-Mail: urshepp@bluewin.ch

Table 1 Prevalence rates of PTSD in general population

Study	Sample	Interview	PTSD-diagnosis	PTSD LT			PTSD C		
				Total	M	F	Total	M	F
Breslau [13]	Michigan USA Age 21–30 years n = 1007	NIMH-DIS (home interview)	DSM-III-R	9.2 %	6 %	11.3 %	–	–	–
Creamer [16]	NSMHWB Australia Age ≥18 years n = 10641	CIDI modified version (Computer assisted, lay interviewers, personal interview)	DSM-IV				1.33 % (12-month prevalence)	1.2 %	1.4 %
Davidson [18]	ECA Central North Carolina, USA Age 18–95 years n = 2985	DIS (personal interview)	DSM-III	1.3 %	–	–	0.44 (6-month prevalence)	–	–
de Jong [19]	Epidemiological survey in four post-conflict regions Cambodia (C) Algeria (A) Ethiopia (E) Gaza (G) Age ≥16 years n = 614 (C), 653 (A), 1200 (E), 585 (G)	CIDI (personal interview)	DSM-IV	C: 28.4 % A: 37.4 % E: 15.8 % G: 17.8 %	C: 20.6 % A: 32.2 % E: 16.6 % G: 22.6 %	C: 34.2 % A: 43.8 % E: 15.2 % G: 13.5 %	–	–	–
Helzer [25]	ECA St. Louis, USA Age not provided n = 2493	DIS (personal interview)	DSM-III	0.72 %	0.52 %	0.85 %	–	–	–
Kessler [28]	NCS USA Age 15–54 years n = 5877	Modified versions of PTSD modules of CIDI and DIS (personal interview)	DSM-III-R	7.8 %	5 %	10.4 %	–	–	–
Kilpatrick [29]	NSA USA Age 12–17 years n = 4023	Modified version of the PTSD module NWS (telephone interview)	DSM-IV	–	–	–	4.9 % (6-month prevalence)	3.7 %	6.3 %
Perkonig [38]	Germany Age 14–24 years n = 3021	CIDI (personal interview)	DSM-IV	1.3 %	0.4 %	2.2 %	0.7 % (12-month prevalence)	0.1 %	1.2 %
Resnick [39]	USA Adult women Age 18–34 years n = 4008	Posttraumatic Stress Disorder Interview Schedule/PTSD module NWS (telephone interview)	DSM-III-R (criterion F not included)	–	–	12.3 %	–	–	4.6 % (current)
Stein [44]	Canada Age > 18 years n = 1002	Modified PTSD Symptom Scale (telephone interview/ lay interviewers)	DSM-IV	–	–	–	–	Full PTSD 1.2 % partial PTSD 0.3 % full/ partial 1.5 % (1-month prevalence)	Full PTSD 2.7 % partial PTSD 3.4 % full/ partial 6 % (1-month prevalence)
Van Zelst [48]	The Netherlands Age 55–85 years n = 422	CIDI (personal interview) SRIP	DSM-IV				Full PTSD 0.9 % (6-month prevalence) subthreshold PTSD 13.1 %		

CIDI WHO's Composite International Diagnostic Interview; DIS Diagnostic Interview Schedule; SRIP Self-rating inventory for PTSD; ECA Epidemiologic Catchment Area Program; NCS National Comorbidity Survey; NSA National Survey of Adolescents (USA); NWS National Women's Study (PTSD module NWS: modified from the DIS); NSMHWB National Survey of Mental Health and Wellbeing (Australia); LT lifetime; C current

The broad range of prevalence rates may be attributed in part to differences in methodology. It may also reflect the varying risk of exposure to PTE in different communities, explaining the high PTSD prevalence rates in post-conflict areas [19] and the low prevalence in Germany for example [38]. However, Creamer found a relatively high lifetime prevalence for PTE and, at the same time, a low prevalence of PTSD in Australia [16]. The risk of developing PTSD depends on a variety of risk factors [15] and the resilience and vulnerability of the individual affected [36], but also on the type of trauma. The conditional risk, i.e. the risk of developing PTSD after exposure to a PTE is about 8–25% for any trauma [13, 14, 17, 33, 38]. In women, the conditional risk of developing PTSD after rape, sexual and physical assault has been reported to be about 30–40%, whereas, after non-crime events, it appears to be less than 10% [39].

■ Aims of the study

To estimate the lifetime prevalence rate of exposure to PTE and the 12-month prevalence of PTSD in a representative sample of the general population at ages 34/35 and 40/41, data were obtained from the 1999 and from the 1993 interviews of the Zurich Cohort Study [6, 7]. The interview comprised a PTSD section according to the Diagnostic and Statistical Manual of Mental Disorders (DSM III-R and IV) [1, 3]. This is the first community-based study on the prevalence of trauma and PTSD in Switzerland.

Material and methods

■ Subjects

The initial screening sample (1978) of the Zurich Cohort Study consisted of a cohort of 4547 young adults (2201 males, aged 19 years; 2346 females, aged 20 years), representative of the Canton of Zurich, Switzerland. All participants were screened by means of the Symptom Checklist 90-Revised (SCL-90-R) [20] in 1978. From this cohort, a subsample of 591 subjects (292 males, 299 females) was drawn. Two-thirds of the sample were randomly selected from those scoring above the 85th percentile on the SCL-90-R. One-third was randomly selected from those scoring below the 85th percentile [35]. The 591 participants in the sample represent, after weighting, 2599 persons in the general population.

Between 1979 and 1999 participants were prospectively interviewed six times. Across 20 years, 60.1% of the original sample continued to participate in the study [21]. For the present study, data from the 1999 and the 1993 interviews were analysed. In 1993, 407 subjects (192 males, 215 females) and, in 1999, 367 subjects (162 males, 205 females) were interviewed. Dropouts in the 1999 interview were less likely to be female ($p=0.001$). In the 1993 and 1999 interviews, dropouts were more often single (1993: $p<0.001$; 1999: $p<0.001$). Dropouts in both interviews had less lifetime psychiatric comorbidity ($p<0.001$), but did not significantly differ regarding the SCL-90 assessed in 1978.

Detailed analyses of conditional risk, comorbidity, personality traits and sociodemographic characteristics were restricted to the 1999 data, when DSM-IV criteria for PTSD had been applied.

■ Measures

The *Structured Psychopathological Interview and Rating of the Social Consequences for Epidemiology* (SPIKE) [5] was administered by clinically trained psychiatric residents and clinical psychologists. For the 1993 and 1999 interviews, the SPIKE was complemented by a PTSD module according to DSM-III-R and DSM-IV, respectively [1, 3]. Information about PTE was obtained by asking the participants whether they had experienced or witnessed an event or events that involved actual or threatened death, serious injury or a threat to the physical integrity of self or others (criterion A1 for PTSD, DSM-IV). Several typical events were proposed and participants were asked whether any of these or similar events had happened to them. In 1999, participants were asked in addition whether they had felt intense fear, helplessness, or horror (criterion A2 for PTSD, DSM-IV). Participants could report multiple events. They were asked about the presence of PTSD symptoms (criteria B, C and D), their duration (criterion E), and distress and/or impairment in social, occupational or other important areas of functioning caused by the disturbance (criterion F).

If participants reported exposure to a PTE, they were asked to describe the trauma. Traumatic events were categorized according to Breslau [14] under the main headings: (1) assaultive violence, (2) other injury or shocking experience, (3) learning of another person's trauma, and (4) sudden unexpected death of a close friend or relative.

■ Diagnostic definitions

For the diagnosis of PTSD according to DSM-IV, all criteria A–F have to be fulfilled. Subthreshold (partial) PTSD was established according to Stein et al. [10, 44] if the symptomatic criteria for criterion B (re-experiencing cluster, ≥ 1 symptom) plus either C (avoidance cluster, ≥ 3 symptoms) or D (hyperarousal cluster, ≥ 2 symptoms) were fulfilled, but not C and D.

The classification of the other psychiatric disorders has been described in detail elsewhere [8].

The *Symptom Checklist* (SCL-90-R) [20, 23] was used to assess a broad spectrum of psychological complaints. The SCL-90-R comprises nine subscales: somatisation, obsessive compulsive, interpersonal sensitivity, depression, anxiety, anger, phobia, paranoid ideation and psychoticism. Two independent SCL-scales were also used: emotional irritability and vegetative irritability. These were derived from factor and cluster analyses of a sample of 5310 males and females from the Canton of Zurich which included the initial screening sample used for the Zurich study [40]. Emotional irritability describes psychologically experienced complaints and includes items from all original SCL scales except for somatisation and aggressiveness. Vegetative irritability describes somatic complaints and is mainly formed from items from the original somatisation scale.

The *Freiburg Personality Inventory* (FPI) is a 212-item self-rating questionnaire comprising nine primary personality factors (nervousness, spontaneous aggression, depressiveness, irritability, sociability, resilience, striving for dominance, inhibition and frankness) [22]. Three secondary factors, aggressiveness, extraversion, and neuroticism/vegetative lability, were derived from a factor analysis of large samples, as described in former publications [4, 34, 40].

For the assessment of coping, the 64-item *Questionnaire of Modes of Coping with Chronic Disease* was used [30]. Self-esteem and mastery was assessed with the *Structure of Coping* questionnaire [37].

A *modified life-event-inventory* based on Tennant and Andrews [6, 45, 46] was administered for the assessment of general life events. Items not applicable to young people (e.g. retirement) were excluded and some other more suitable items were added, assessing changes in life habits [26].

■ Statistical analyses

Groups were compared using Kruskal-Wallis tests for continuous variables (SCL-90), and χ^2 – tests for frequency data. Prevalence rates were weighted to correct for stratified sampling, i.e. for the over-rep-

resentation of high-scorers in the SCL-90. Analyses were carried out in STATA 8.2 for Windows.

Informed consent was obtained from all participants. The study was approved by the Institutional Review Board of the University of Zurich.

Results

■ Lifetime prevalence of exposure to traumatic events

In the 1999 interview, 128 (34.9%) participants (33.3% of males and 36.1% of females; $p=0.58$) reported 179 lifetime PTE according to DSM-IV criterion A. Of those, 91 (71.1%) reported one, 23 (18%) two, and 14 (10.9%) three or more such events.

Overall, the weighted lifetime prevalence of PTE was 28%; it showed no gender difference. Detailed information on PTE categorised according to Breslau [14] is shown in Table 2. Women experienced assaultive violence 2.8 times more often than men, whereas men tended to experience more life-threatening illnesses and witnessed more death or injury in others.

In 1993, 130 (31.9%) participants (28.7% of males and 34.9% of females; $p=0.18$) reported 147 lifetime

PTE according to DSM-III criterion A. Of those, 115 (28.3%) reported one, 12 (2.9%) reported two, and 3 (0.7%) reported three or more PTE. The weighted lifetime prevalence of exposure to PTE was 26.6%; there was no gender difference.

■ 12-month prevalence of PTSD

Of the 128 subjects in the 1999 interview who reported exposure to PTE (criterion A), none met all the remaining criteria B–F for PTSD. Eleven (2 males and 9 females) met the criteria for subthreshold PTSD without criteria E (duration) and F (impairment). This corresponds to a weighted prevalence of 1.30% (0.26% for males; 2.21% for females). In all, 3.4% (2.4% for males; 4.4% for females) met the B criterion (re-experiencing), 0.77% (0.41% for males; 1.2% for females) met criterion C (avoidance), and 1.3% (0.14% for males; 2.5% for females) met criterion D (hyperarousal).

In 1993, we found an almost identical picture. No participant met all criteria for PTSD according to the DSM-III-R. Thirteen participants (5 males and 8 females) met the criteria for subthreshold PTSD, corresponding to a

Table 2 Lifetime prevalence rates and standard errors (SE) of potentially traumatic events assessed in 1999 according to DSM-IV

Type of trauma	Males	Females	Total
Assaultive violence ^a	2.01 (1.50)	5.56 (1.89)	3.91 (1.23)
Military combat	0	0	0
Raped	0	1.14 (0.36)	0.61 (0.19)
Held captive, tortured or kidnapped	0	0.11 (0.11)	0.06 (0.06)
Shot or stabbed	0	0	0
Other kind of sexual assault	0.13 (0.13)	0.69 (0.28)	0.43 (0.16)
Mugged, held up, or threatened with a weapon	0.53 (0.26)	3.5 (1.83)	2.12 (1.0)
Badly beaten up	1.49 (1.48)	0.34 (0.2)	0.88 (0.7)
Any other assaultive violence	0.13 (0.13)	0.11 (0.11)	0.12 (0.08)
Other injury or shocking experience	15.06 (3.97)	17.07 (3.96)	16.14 (2.81)
Serious car accident	5.25 (2.54)	4.45 (2.21)	4.82 (1.67)
Any other kind of serious accident or injury	0.66 (0.3)	4.22 (2.2)	2.56 (1.2)
Fire, flood, earthquake, or other natural disaster	0	0.23 (0.16)	0.12 (0.09)
Diagnosed with a life-threatening illness	2.28 (1.52)	0.34 (0.2)	1.24 (0.71)
Child of yours diagnosed as having a life-threatening illness	0.13 (0.13)	0.11 (0.11)	0.12 (0.09)
Witnessed someone being killed or seriously injured	3.37 (2.09)	1.75 (1.31)	2.5 (1.2)
Unexpectedly discovering a dead body	0.13 (0.13)	0	0.06 (0.06)
Learning about traumas to others	1.88 (1.50)	1.86 (1.31)	1.87 (0.99)
Learned that a close friend/relative was raped or sexually assaulted	0	0.11 (0.11)	0.06 (0.06)
Learned that a close friend/relative was seriously physically attacked	0	1.41 (1.29)	0.75 (0.69)
Learned that a close friend/relative was seriously injured in a motor vehicle crash	1.62 (1.49)	0.23 (0.16)	0.88 (0.7)
Learned that a close friend/relative was seriously injured in any other accident	0.13 (0.13)	0	0.06 (0.06)
Learned that a close friend/relative was involved in any other trauma	0.13 (0.13)	0.23 (0.16)	0.18 (0.11)
Sudden unexpected death of a close friend or relative	9.02 (3.22)	8.06 (2.82)	8.51 (2.13)
Any trauma	27.46 (5.03)	28.48 (4.65)	28.01 (3.41)

^a non-significant (all $p > 0.19$)

weighted prevalence rate of 1.90% (2.9% for males; 0.9% for females). In all, 9.8% (8.6% for males; 10.9% for females) met the B criterion (re-experiencing), 1.7% (2.6% for males; 0.99% for females) met criterion C (avoidance), and 1.6% (2.2% for males; 0.99% for females) met criterion D (hyperarousal). Only two subjects met subthreshold PTSD criteria at both the 1993 and 1999 interviews.

Further analyses will be restricted to the 1999 sample.

■ Conditional risk

Of the 11 subthreshold PTSD subjects in 1999, eight (72.7%) had experienced an assaultive trauma, whereas of the 117 subjects who reported PTE but no PTSD symptomatology, only 25 (21.4%) had a history of assaultive traumas. Unexpected or threatened death of a close friend or relative led in one case to a subthreshold PTSD.

■ Comorbidity

On a symptom level as assessed by the SCL-90-R, a comparison between participants exposed to PTE with and without subthreshold PTSD revealed significantly higher levels for the 11 subthreshold PTSD participants on the SCL-90-R subscales for depression ($p = 0.03$) and vegetative irritability ($p = 0.05$). The SCL global severity index was also significantly higher in the subthreshold PTSD group ($p = 0.05$) (Fig. 1). Because only two of this subthreshold group dated their first PTE to after the initial assessment in 1978, further statistical analysis of the onset of symptoms in relation to the traumatic event was not possible.

The analysis of comorbidity on a *dimensional level* compared the following three groups: a) the 11 subthreshold PTSD subjects, b) participants exposed to PTE without subthreshold PTSD, and c) participants without trauma exposure. Subthreshold PTSD subjects had significantly higher levels of depression, anxiety, and ben-

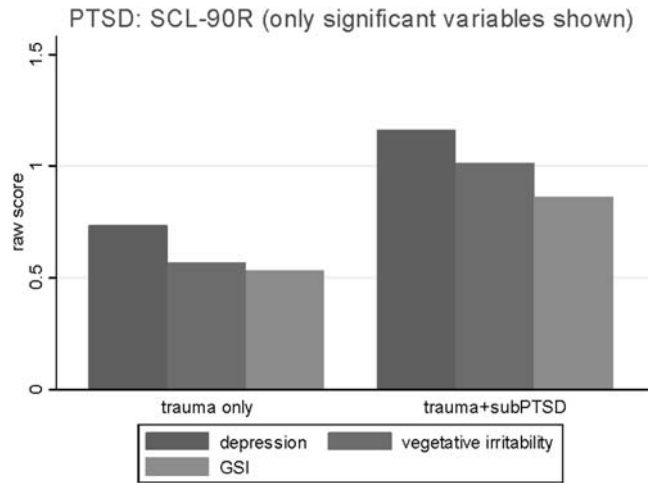


Fig. 1 SCL-90-R for participants exposed to potentially traumatic events

zodiazepine abuse compared with those exposed to PTE without subthreshold PTSD.

Of subjects reporting any depressive symptoms and any lifetime traumatic exposure ($N = 124$), 27.4% dated back their (first) PTE to before the first onset of depressive symptoms. Of subjects who reported lifetime PTE and who had ever experienced symptoms of anxiety or panic ($N = 111$), 20.7% experienced their (first) PTE before the age of onset of these symptoms.

Although in the subthreshold PTSD group the proportion of cases whose (first) PTE had preceded the onset of depressive or anxious symptoms was slightly higher, the differences were not significant ($p = 0.35$ and $p = 0.45$, respectively).

On a *categorical level*, subthreshold PTSD subjects met the diagnostic criteria for major depression, agoraphobia and benzodiazepine abuse/dependence significantly more often. For details see Table 3.

■ Personality traits

Subthreshold PTSD subjects ($N = 11$) were compared to participants with a lifetime history of PTE exposure

Table 3 Frequency of comorbid diagnoses in subjects with and without subthreshold PTSD

	No traumatic event N = 239 (1)	Traumatic event without subPTSD N = 117 (2)	Traumatic event with subPTSD N = 11 (3)	p(2 vs. 3) χ^2 -test
MDE	34.3	44.4	90.9	0.03
BP-I/II	3.8	7.7	9.1	0.73
Anxiety	18.4	29.9	54.6	0.17
Agoraphobia	8.0	9.4	36.4	0.04
Social phobia	14.2	16.2	36.4	0.31
Benzodiazepines abuse/dependence	1.3	0.9	9.1	0.001
Suicidality	9.6	18.8	45.5	0.14

subPTSD subthreshold PTSD

without PTSD symptoms ($N = 117$) regarding FPI aggressiveness, FPI extraversion and FPI neuroticism/vegetative lability (assessed in 1993), coping, mastery and self-esteem (assessed in 1999). There were no significant group differences, except for FPI neuroticism/vegetative lability scores, which were higher in the subthreshold PTSD group (6.8 vs. 4.5, $p < 0.02$).

■ Sociodemographic characteristics

Subthreshold PTSD cases were more often divorced or separated ($p = 0.009$), reported more chronic illnesses ($p = 0.008$) and had a lower educational level ($p = 0.014$) and a lower socio-economic status ($p = 0.05$) compared to those who reported PTE without subthreshold PTSD.

■ Life events

Participants with and participants without subthreshold PTSD who had lifetime PTE exposure did not significantly differ in their general life events as measured by the *modified life-event-inventory* [6, 45, 46].

Discussion

Epidemiological studies on trauma and PTSD in the general population are scarce, and reported prevalence rates vary remarkably according to the population. The strength of this study was to provide data on the prevalence of PTE and PTSD in a well-characterised representative age cohort in Switzerland at two points in time using the DSM-III-R and DSM-IV criteria by means of face-to-face interviews performed by clinically trained psychiatric residents and clinical psychologists.

■ Prevalence of exposure to potentially traumatic events

The lifetime prevalence of exposure to PTE is age-dependent [38, 43]. In our study, at the age of 40/41 years, the prevalence was 28%. Lower prevalence rates have been reported for 16- to 22-year-old adolescents in the USA (15%) [17] and 14- to 24-year-old German adolescents (21.4%) [38]. Higher rates were found in studies embracing all adults. In the National Comorbidity Study (NCS), the lifetime prevalence for PTE exposure was 60.7% for males and 51.2% for females, and the majority of those who experienced any lifetime PTE reported more than one event [28]. In the Detroit Area Survey of Trauma [14], the lifetime exposure to any PTE was even as high as 89.6%, with a mean number of PTE of 5.3 for males and 4.3 for females. A total of 37.7% reported at least one episode of assaultive violence [13]. Creamer et al. [16] reported prevalence rates for PTE exposure in Australia which were nearly identical to the NCS data

[28], while in Canada the prevalence of traumatic exposure was 81.3% for males and 74.2% for females, with about half of those exposed to PTE reporting multiple events [44].

Although the overall rate of traumatic exposure showed no gender difference in our sample, women experienced assaultive violence 2.8 times more frequently than men did. In view of the above-cited epidemiological studies, this is a unique result. A possible explanation for the lack of a higher prevalence in men could be that Swiss men are less at risk of traumatic exposure on account of the relatively low crime rate and the absence of combat-related traumas; whereas, for women, the risk of violence, especially sexual violence, is rather comparable to that in other countries. After controlling for trauma and sociodemographic factors, women have consistently been shown to be at higher risk of developing PTSD following traumatic exposure [14, 15]; our results confirm this for PTSD symptoms.

■ Prevalence of PTSD

The most striking result of our study is that no subjects met the full criteria for PTSD according to the DSM-IV. Only 11 subjects met the criteria for subthreshold PTSD-syndrome [i. e. without criteria E (duration) and F (impairment)], representing a weighted prevalence of 1.30%. Similarly, in the interview carried out in 1993, no participant was diagnosed with a PTSD according to DSM-III-R.

In contrast to international epidemiological data, PTSD in the Swiss general population seems to be a very rare condition (see Table 1). There are several possible partial explanations. First of all, we assessed the 12-month prevalence and not lifetime prevalence rates for PTSD. A further explanation would be the relatively low prevalence of exposure to PTE; however, given a prevalence of PTE exposure of 28%, one would still expect a certain proportion of subjects to develop PTSD. A more plausible explanation could be that Switzerland has not been actively involved in warfare for 150 years and has not seen major natural disasters in the past decades. In the United States, for example, the prevalence of combat-related traumatic experiences was 6.4% for males, and the prevalence of traumatic experiences related to natural disasters was 18.9% for males and 15.2% for females (NCS study) [28]. A further explanation could be the relatively low rate of physical violence in Switzerland. This hypothesis is supported by the relatively low average homicide rate of 2.6 per 100,000 from 1990 to 1996 in Switzerland compared to the European average of 7.2 per 100,000 for the same period (<http://www.euro-peansourcebook.org>). Indeed, males in our study had a very low prevalence of exposure to assaultive violence. Moreover, only Swiss citizens were recruited for this study in 1978. Given that today the Swiss population comprises approximately 21% non-Swiss citizens, the results may not mirror today's situation, characterised

by a high rate of immigrants and refugees from conflict regions.

In fact, our results are in line with earlier data on Swiss accident victims, showing that only 5% of seriously injured patients referred to an intensive care unit (ICU) immediately after the accident developed a full PTSD; in a 1-year follow-up, the PTSD persisted in only 2% [41]. These results again contrast with international studies, where the conditional risk for motor vehicle accidents was distinctly higher [10, 31, 47]. A recent study showed that there was no increase in psychiatric inpatient admissions in Switzerland in the aftermath of global or local disasters [24].

In our study, the conditional risk for developing a subthreshold PTSD was highest for assaultive (including sexual) violence. Due to the low number of cases, further statistical analyses were not possible, but the results are in line with the literature [14, 15, 33]. Most of the eight subthreshold PTSD subjects in 1999 with a history of assaultive violence were women, explaining the relatively high proportion of women in the subthreshold PTSD group.

Subthreshold PTSD subjects scored higher on the SCL-90-R. On the one hand, this could reflect some overlap of PTSD symptoms with the SCL-90-R scales and indicate that these patients, while not qualifying for the diagnosis of full PTSD, felt disturbed. On the other hand, this could also be an indicator of true psychiatric comorbidity. Due to the small number of subjects with PTSD symptoms, it was not possible to further analyse whether the higher SCL-90-R scores were a consequence of the trauma exposure or an indicator of preexisting increased vulnerability.

Subjects with subthreshold PTSD had the highest comorbidity levels with significantly more diagnoses of major depression, agoraphobia and benzodiazepine abuse. The high comorbidity in PTSD patients is a well-known phenomenon [13, 28]. In addition, subjects with exposure to PTE without PTSD symptoms also had higher levels of comorbidity than non-traumatised subjects. It is possible that, after exposure to PTE, some people develop specific symptoms, such as re-experiencing (PTSD-criterion B), whereas others develop uncharacteristic posttraumatic syndromes such as depression, anxiety, somatisation and substance abuse.

■ Limitations of our study

The sample represents an age cohort and the results are, therefore, not generalisable to all ages; the sample is relatively small, and statistical comparisons between the 11 cases of subthreshold PTSD and the 117 subjects with exposure to PTE only are susceptible to type II errors; the study was restricted to Swiss citizens in a period of relatively low influx of refugees and immigrants from conflict regions.

Conclusions

The prevalence of exposure to PTE in Switzerland at age 40/41 was relatively low. Women experienced more assaultive violence than men. Surprisingly, we found not a single case of full PTSD in our sample, and even the prevalence of subthreshold PTSD was very low. The fact that Switzerland has not been involved in war for 150 years, has not experienced any major natural disasters in recent decades, the relatively low crime rate and the virtual absence of terrorism, in addition to the political and economic stability may well contribute to a sense of security which, to some extent, protects Swiss citizens from developing PTSD in the aftermath of traumatic experiences.

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