



BASIC RESEARCH ARTICLE



Exposure to potentially traumatic events in young Swiss men: associations with socio-demographics and mental health outcomes (alcohol use disorder, major depression and suicide attempts)

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ABSTRACT

Background and objective: The aims of this study were to estimate the lifetime and 12-month prevalence of exposure to potentially traumatic events (PTEs) in young men in Switzerland and to assess factors and mental health outcomes associated with such events.

Method: Data were drawn from the Cohort Study on Substance Use Risk Factors (C-SURF), encompassing 5,223 young men. Exposure to PTEs was assessed using the Post-traumatic Diagnostic Scale (PDS), Trauma History Questionnaire (THQ) and Life Event Checklist (LEC).

Results: Lifetime prevalence of PTEs was 59.4%, with 37.3% reporting multiple types of events. Twelve-month prevalence was 31.2%, with 12.7% reporting multiple types of events. Low education level of participants, high maternal education, family affluence below average, and not living with biological parents were associated with a higher risk of having experienced one or more PTEs in one's lifetime. Low education level of participants and high maternal education were also related to exposure to one or more PTEs over the past 12 months. Logistic regression analyses demonstrated that PTE exposure was directly associated with all assessed mental health outcomes. The strongest relationship was found between exposure to multiple types of PTEs and suicide attempts (adjusted OR 4.9 [95% CI: 2.9–8.4]).

Conclusions: These results indicate that having experienced one or multiple types of PTEs is common in Swiss young men. Efforts should be intensified to reduce exposure to PTEs and prevent and treat resulting problematic mental health outcomes in young adults.

Exposición a eventos potencialmente traumáticos en varones jóvenes suizos, Asociación con resultados socio demográficos y de salud mental (trastorno por uso de alcohol, depresión mayor e intentos suicidas)

Antecedentes y objetivos: Los objetivos de este estudio fueron estimar la prevalencia de vida y de 12 meses de exposición a eventos potencialmente traumáticos (PTEs) en varones jóvenes en Suiza y evaluar los factores y consecuencias en salud mental asociadas con tales eventos.

Método: La información fue obtenida del Estudio de Cohorte en Factores de Riesgo de Uso de Sustancias (C-SURF, por sus siglas en inglés), que abarca 5.223 hombres jóvenes. La exposición a PTEs fue evaluada usando la Escala de Diagnóstico Posttraumático (PDS), el Cuestionario de Historia de Trauma (THQ) y la Lista de Chequeo de Eventos Vitales (LEC).

Resultados: La prevalencia de vida de PTEs fue de 59,4%, con un 37,3% que reportó múltiples tipos de eventos. La prevalencia a doce meses fue de 31,2%, con 12,7% que reportó múltiples tipos de eventos. El bajo nivel educacional de los participantes, la alta educación materna, la riqueza familiar por debajo del promedio y el hecho de no vivir con padres biológicos se asociaron con un mayor riesgo de haber experimentado una o más PTEs en la vida de una persona. Bajo nivel educativo de los participantes y alta educación materna también se relacionaron con la exposición a una o más PTE en los últimos 12 meses. El análisis de regresión logística demostró que la exposición a PTE estuvo directamente asociada con todos los resultados de salud mental evaluados. La relación más fuerte se encontró entre la exposición a múltiples tipos de PTEs e intentos suicidas (OR ajustada 4.9 [IC 95%: 2.9-8.4]).

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Trauma; evento traumático; consecuencias en salud mental; prevalencia de eventos potencialmente traumáticos; eventos de vida; socio-demográficos

关键词

创伤创伤事件; 心理健康结果; 潜在创伤事件的流行率; 生活事件; 社会人口统计

HIGHLIGHTS

- Exposure to PTEs is common among young Swiss men.
- Education level of participants and of their mothers, family affluence and living arrangements are associated with PTE exposure.
- PTE exposure is associated with AUD, MD and suicide attempts.
- Efforts should be intensified to reduce exposure to PTEs and to prevent and treat resulting problematic mental health outcomes in young adults.

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Conclusiones: Estos resultados indican que haber experimentado uno o múltiples tipos de PTEs es frecuente en los varones jóvenes Suizos. Se deberían intensificar esfuerzos para reducir la exposición a PTEs y prevenir y tratar las consecuencias problemáticas resultantes en salud mental en los adultos jóvenes.

年轻瑞士男性暴露潜在创伤事件与社会人口统计学和心理健康结果（酒精使用障碍，重大抑郁症和自杀未遂）的关联

背景和目的: 本研究的目的估计瑞士年轻男性接触潜在创伤事件（PTEs）的终生和12个月流行率，并评估与此类事件相关的因素和心理健康结果。

方法: 数据来自关于物质使用风险因素（C-SURF）的群组研究，被试包括5223名年轻男性。使用创伤后诊断量表（PDS），创伤历史问卷（THQ）和生活事件检查表（LEC）评估PTE暴露。

结果: PTE的终生发生率为59.4%，37.3%报告多种类型的事件。12个月的发生率为31.2%，其中12.7%报告了多种类型的事件。受教育程度低的参与者，母亲教育程度较高，低于平均水平的家庭富裕，以及与亲生父母分开生活，与在一生中经历过一个或多个PTE的风险较高有关。受教育程度低的参与者和高度的母亲教育也与过去12个月内暴露一个或多个PTE有关。Logistic回归分析表明，PTE暴露与所有评估的心理健康结果直接相关。在暴露于多种类型的PTE和自杀企图之间发现了最强的关系（调整后的OR 4.9 [95%CI: 2.9-8.4]）。

结论: 这些结果表明，经历过一种或多种类型的PTE在瑞士青年男性中很常见。需要更多工作来减少年轻人对PTE的接触，预防和治疗年轻人的精神健康问题。

1. Introduction

Experiencing potentially traumatic events (PTEs) have been associated with poor mental and physical health (Agorastos et al., 2014; Del Gaizo, Elhai, & Weaver, 2011; Glaesmer, 2014; Löwe et al., 2011; Park, Hong, Jeon, Seong, & Cho, 2015), functional impairment (Löwe et al., 2011) and increased engagement in health-risk-taking behaviours (Del Gaizo et al., 2011). Previous studies have shown that a large proportion of adults have been exposed to at least one PTE over their lifetime (estimates ranging from 21% to 90%) (Amstadter, Aggen, Knudsen, Reichborn-Kjennerud, & Kendler, 2013; Benjet et al., 2016; Hepp et al., 2006; Kilpatrick et al., 2013; Netto et al., 2013; Perkonig, Kessler, Storz, & Wittchen, 2000). In this context, young adults, and especially men, appear to be more prone to experiencing PTEs than people in other age groups (Amstadter et al., 2013; Fetzner, McMillan, Sareen, & Asmundson, 2011; Hatch & Dohrenwend, 2007; Jaen-Varas et al., 2016; Perkonig et al., 2000). In general, young adulthood is a critical period in life for all young adults, because it involves substantial changes in every life domain, such as ending formal education, initiating professional life, becoming (financially) independent of parents, and even starting one's own family (Degenhardt, Stockings, Patton, Hall, & Lynskey, 2016). Thus, exposure to PTEs during this vulnerable stage may increase the likelihood of developing mental health issues and assuming health-risk taking behaviours, like excessive alcohol consumption that can, in turn, have long-term negative effects over the course of adult life. Acquiring better insights into the prevalence of PTE exposure, its associated factors and possible associations with

mental health outcomes in young adults may, therefore, be crucial to prevent negative consequences during later phases of life in those people who have experienced PTEs.

In Switzerland, the prevalence of PTEs has primarily been studied in children and adolescents (Landolt, Schnyder, Maier, Schoenbucher, & Mohler-Kuo, 2013; Mohler-Kuo et al., 2014). For adults, only one study has been published, using a cohort of one Canton (the 'Zurich study') when the cohort was 34 and 41 years old (Hepp et al., 2006). To our knowledge, no recent studies have investigated the prevalence of PTEs in young men in Switzerland or related socio-demographic factors and mental health outcomes.

The aims of the present study were, therefore, (1) to measure lifetime and 12-month prevalence rates for PTEs in a large, representative sample of young Swiss men; (2) to identify socio-demographic factors associated with the exposure to such events; and (3) to investigate the relationship between exposure to PTEs and the presence of particular mental health outcomes. For the present study, data were drawn from an ongoing cohort study ('Cohort Study on Substance Use Risk Factors' (C-SURF)) that has been surveying young Swiss men from late adolescence into early adulthood; we focused on three mental health outcomes that were assessed in the context of this particular study and have been previously reported to be more prevalent in adults who have experienced PTEs: alcohol use disorder (AUD), major depression (MD) and suicide attempts (Amstadter et al., 2013; Fetzner et al., 2011; Jaen-Varas et al., 2016; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; LeBouthillier, McMillan, Thibodeau, & Asmundson, 2015; Löwe et al., 2011; Netto et al., 2013; Park et al., 2015; Perkonig et al., 2000; Pietrzak, Goldstein, Southwick, & Grant, 2011).

2. Materials and methods

2.1. Study design

Data were drawn from C-SURF, which had initially been designed to investigate substance use patterns within young Swiss men over time. Prior to data collection, the C-SURF protocol had been approved at Lausanne University by the Ethics Committee for Clinical Research (protocol number 15/07). Informed written consent was obtained from all participants before starting the assessments.

Participants were recruited at three of the six centres that recruit men for military service in Switzerland, encompassing 21 of the 26 Swiss cantons, including all French-speaking and a large portion of the German-speaking regions. In Switzerland, army recruitment is mandatory; thus, all Swiss men are evaluated to determine their eligibility for military service, civil service, or no service at around age 19. Both those who were deemed eligible for military or civil service and those deemed ineligible to serve in the army were eligible for enrolment in our study. As there is no pre-selection to army conscription, this procedure provided us with access to a representative sample of young Swiss men for the 21 cantons that are covered by the recruitment centres. The study is, therefore, representative for French-speaking areas but not for all German-speaking areas. Note that these army centres were used only for enrolment of subjects; both the study itself and subject participation were totally independent of the army. Furthermore, the assessment of sensitive information was handled anonymously by assigning each participant a numerical code that was stored separately from their personal data. The present study used data collected during C-SURF waves 1 and 2. The questions were assessed by self-reports, primarily online, but also with paper-pencil upon request. The completion of each questionnaire took about 45 to 60 minutes. Incentives given to participants were vouchers of 30 CHF for each questionnaire. Given the length of the cohort study (total of 10 years) and the multiple assessments planned during this period, to further increase motivation to participate, an additional 30 CHF of compensation was given to participants when both questionnaires were completed.

2.2. Participants

From the 7,563 conscripts who consented to participate in writing, 5,990 (79.2%) participated in the baseline assessment (wave 1); of these, 5,223 (87.2%) also completed a one-year follow-up assessment (wave 2). One hundred eighty-eight individuals were excluded from our analyses due to missing data so that the final sample consisted of 5,035 subjects (84.1% of the original 5,990).

2.3. Assessment of PTEs

Exposure to PTEs was assessed during wave 2 at one-year follow-up using part 1 of the Posttraumatic Diagnostic Scale (PDS-enhanced) (Foa, 1995), which consists of items examining 12 different forms of PTE, including a single open-ended question asking about any additional PTEs. This list of PTEs was complemented by seven additional events drawn from the Trauma History Questionnaire (THQ) (Hooper, Stockton, Krupnick, & Green, 2011) and three from the Life Event Checklist (LEC). All items are shown in Table 1. To assess lifetime and 12-month prevalence rates, for each event participants were asked to indicate whether or not they had experienced the event and, if so, whether it had happened within the last 12 months or beforehand.

2.4. Socio-demographic variables

Socio-demographic variables included the subject's current age ('younger than 21 years' vs. '21 years or older'), linguistic region ('German-' vs. 'French-speaking') and education level ('primary school' vs. 'secondary vocational school' vs. 'high school/university'), which were assessed in wave 2. Furthermore, several family-related variables, collected in wave 1, were included; that is, maternal education ('primary school' vs. 'secondary vocational school' vs. 'high school/university'), paternal education ('primary school' vs. 'secondary vocational school' vs. 'high school/university'), family affluence ('above average' vs. 'average' vs. 'below average') and living arrangement before the age of 18 ('living with biological parents' vs. 'living with others').

2.5. Mental health outcomes

2.5.1. AUD

Symptoms of AUD within the past 12 months at wave 2 were assessed using a questionnaire (Knight et al., 2002) adapted from the Semi-Structured Assessment for the Genetics of Alcoholism (SSAGA) (Bucholz et al., 1994; Hesselbrock, Easton, Bucholz, Schuckit, & Hesselbrock, 1999). In accordance with the DSM-5 criteria (American Psychiatric Association, 2013), the 'likely presence' of AUD was defined as a positive response to at least two of eleven symptoms and coded as a binary variable ('no AUD' vs. 'AUD').

2.5.2. MD

Symptoms of MD were assessed in wave 2 with the Major Depressive Inventory (ICD-10) – WHO-MDI (Bech, Rasmussen, Olsen, Noerholm, & Abildgaard, 2001; Olsen, Jensen, Noerholm, Martiny, & Bech, 2003). Answers were assessed using a 6-point scale (0

Table 1. Lifetime and 12-month prevalence rates of PTEs in the study cohort.

| | N = | Life-time prevalence | | 12-Month Prevalence | |
|---|-------|----------------------|------|---------------------|------|
| | | n | % | n | % |
| Any PTE | 5,035 | 2,991 | 59.4 | 1572 | 31.2 |
| Multiple types of PTEs | 5,035 | 1,879 | 37.3 | 640 | 12.7 |
| THQ Any other situation in which you feared you or someone else might be killed or seriously injured | 5,020 | 1,220 | 24.3 | 506 | 10.1 |
| PDS Serious accident, fire, or explosion (e.g. an industrial, farm, car, plane, or boating accident) | 5,024 | 1,070 | 21.3 | 338 | 6.7 |
| LEC ^a Serious injury, life-threatening illness or unexpected death of a loved one | 5,021 | 1,028 | 20.5 | 355 | 7.1 |
| THQ Been in any other situation in which you were seriously injured, or someone else was seriously injured or even killed | 5,024 | 807 | 16.1 | 233 | 4.6 |
| PDS Non-sexual assault by a stranger (e.g. being mugged, physically attacked, shot, stabbed, or held at gunpoint) | 5,022 | 755 | 15.0 | 267 | 5.3 |
| THQ ^b Seen a severely injured person or a dead body (other than at a funeral) | 5,016 | 700 | 14.0 | 268 | 5.3 |
| PDS Other traumatic event | 5,035 | 528 | 10.5 | 268 | 5.3 |
| PDS Natural disaster (e.g. tornado, hurricane, flood, or major earthquake) | 5,020 | 401 | 8.0 | 74 | 1.5 |
| PDS Non-sexual assault by a family member or someone you know (e.g. being mugged, physically attacked, shot, stabbed, or held at gunpoint) | 5,024 | 283 | 5.6 | 94 | 1.9 |
| PDS Sexual contact when you were younger than 18 with someone who was 5 or more years older than you (e.g. contact with genitals, breasts) | 5,011 | 261 | 5.2 | 33 | 0.7 |
| PDS Life-threatening illness | 5,013 | 230 | 4.6 | 60 | 1.2 |
| THQ Anyone tried to or succeeded in breaking into your home while you were there | 5,017 | 217 | 4.3 | 54 | 1.1 |
| THQ Any other disaster such as a building collapse, bank robbery, etc., where you felt you or your loved ones were in danger of death or injury | 5,026 | 191 | 3.8 | 58 | 1.2 |
| THQ Exposed to dangerous chemicals or radioactivity that might threaten your health | 5,014 | 168 | 3.4 | 100 | 2.0 |
| LEC Have you seriously injured, physically harmed or even cause death to someone else | 5,020 | 151 | 3.0 | 40 | 0.8 |
| PDS Military combat or war zone | 5,004 | 128 | 2.6 | 64 | 1.3 |
| PDS Imprisonment (e.g. prison inmate, prisoner of war, hostage) | 5,020 | 101 | 2.0 | 43 | 0.9 |
| PDS Sexual assault by a family member or someone you know (e.g., rape or attempted rape) | 5,022 | 75 | 1.5 | 13 | 0.3 |
| PDS Sexual assault by a stranger (e.g. rape or attempted rape) | 5,017 | 62 | 1.2 | 17 | 0.3 |
| PDS Torture | 5,015 | 46 | 0.9 | 13 | 0.3 |

Note. PTE: potentially traumatic event; PDS: Post-traumatic Diagnostic Scale (Foa, 1995); THQ: Trauma History Questionnaire (Hooper, Stockton, Krupnick, & Green, 2011); LEC: Life Event Checklist (Gray, Litz, Hsu & Lombardo, 2004); All PTEs were assessed during wave 2.

^aThis item represents a combination of items 14 and 15 of the LEC; ^bThis item represents a combination of items 11 and 12 of the THQ.

*Total number of participants (N) recorded for this variable, n varies slightly between variables due to missing data.

‘never’ – 5 ‘all the time’), dichotomised to indicate the absence (0) or presence (1) of each symptom, and afterwards coded to generate a binary variable (‘no MD’ vs. ‘MD’). For the first three items, a symptom was considered present for answer categories from 4 to 5 (corresponding to ‘most of the time’ and ‘all the time’); while for the remaining items, the criterion for the presence of a symptom was considered met for answer categories 3 through 5 (corresponding to ‘more than half of the time’, ‘most of the time’ and ‘all the time’). In accordance with DSM-IV criteria (American Psychiatric Association, 1994), MD was defined as the presence of at least five symptoms, with either symptom #1 or symptom #2 required among those five within the past two weeks (Bech et al., 2001). Participants who failed to answer more than two questions were excluded from further analyses.

2.5.3. Suicide attempts

Suicide attempts within the last 12 months were assessed at wave 2 with a single question adapted from the European School Survey Project on Alcohol and Other Drugs (Hibell, Guttormsson, Ahlström, Balakireva, Bjarnason, Kokkevi, & Kraus, 2007) (Kokkevi, Rotsika, Arapaki, & Richardson, 2012). The original answer format (1 ‘never’ – 5 ‘10 or more times’) was re-coded into a binary variable (‘no suicide attempt’ vs. ‘suicide attempt’).

2.6. Statistical analysis

Data were analysed using the statistical package SPSS 20.0. Contingency tables were used to calculate lifetime and 12-month prevalence rates for each of the PTEs. Binary logistic regression models were created and tested for past experience with both 1) any single PTE, and 2) multiple types of PTEs, with socio-demographic variables entered as potential predictors. These analyses were performed both for lifetime and 12-month PTE exposure, thereby generating a total of four models. Odds ratios (OR) and 95% confidence intervals (CI) were calculated, both unadjusted and adjusted for all socio-demographic variables (age, linguistic region, education, maternal and paternal education, family affluence and living arrangement before the age of 18). To investigate associations between PTE exposure and mental health outcomes, unadjusted and adjusted ORs were computed using 1) any event, and 2) multiple types of events within the last 12 months as predictors and AUD, MD and suicide attempts as outcome variables.

3. Results

3.1. Sample characteristics

Median age of the 5,035 study participants at the time of wave 2 was 21.1 years (range 19–30). The French-language region was represented by 53.8% of the

sample. Of the 5,035 participants, 427 (8.5%) had completed primary and 2,258 (44.8%) secondary school as their highest level of education. Also, 637 (12.7%) and 3,168 (62.9%) reported that their mothers had completed primary and secondary school, respectively, while 477 (9.5%) of conscripts' fathers had completed primary and 2,679 (53.2%) secondary school. A total of 704 (14.0%) subjects rated their family's financial situation as below average and 2,061 (40.9%) as average. A clear majority (3,965, 78.7%) reported having lived with both biological parents at least until they turned 18 years old. In terms of mental health outcomes, 31.2% provided responses consistent with AUD, and 2.9% MD, while 1.2% reported having made at least one suicide attempt.

3.2. Prevalence of PTEs

Lifetime and 12-month prevalence rates for PTEs are presented in Table 1. Overall, 59.4% and 31.2% of the conscripts reported having experienced at least one PTE in their lifetime and within the last 12 months, respectively. More than one-third (37.3%) of the conscripts reported that they had experienced multiple types of PTEs in their lifetime, while one in eight (12.7%) had experienced multiple types of PTEs in the past 12 months. The most commonly reported types of PTE were events during which the respondent was afraid that either he or someone else was at risk of being severely injured or killed (lifetime: 24.3%; 12-month: 10.1%); experiencing a serious accident, fire or explosion (lifetime: 21.3%; 12-month: 6.7%); experiencing a serious injury, life-threatening illness or the unexpected death of a loved one (lifetime: 20.5%; 12-month: 7.2%); been in any other situation in which the respondent was seriously injured or someone else was injured or even killed (lifetime: 16.1%; 12-month: 4.6%); non-sexual assault by a stranger (lifetime: 15.0%; 12-month: 5.3%); and seen a severely injured person or dead body (lifetime: 14.0%; 12-month: 5.3%). The most infrequent events were torture (lifetime: 0.9%; 12-month: 0.3%) and sexual assault by a stranger (lifetime: 1.2%; 12-month: 0.3%) or family member (lifetime: 1.5%; 12-month: 0.3%).

3.3. Socio-demographic variables

3.3.1. Any PTE

A significant association with lifetime trauma exposure was found for linguistic region, the participant's education level, maternal education level, family affluence, and living arrangement before the age of 18. Men from German-speaking regions were more likely to report exposure to a PTE than those from French-speaking regions. Conscripts having completed primary or secondary vocational school only

were also more likely to report exposure to such events than those having a high school/university level education. Relative to participants whose mothers had a high school/university education, those whose mothers had completed primary or secondary vocational school only were less likely to report a PTE in their lifetime. Additionally, men from families with a level of family affluence below average or not living with their biological parents had a higher risk of trauma exposure. After adjusting for socio-demographics, ORs remained significant for all aforementioned variables. No significant association was found between exposure to a PTE and age or paternal education.

Logistic regression analysis revealed that the participant's education level, maternal education level, and living arrangement before the age of 18 were significantly associated with exposure to a PTE in the last 12 months. Subjects with a primary or secondary vocational school level education and those who did not live with their biological parents during their childhood or adolescence were more likely to report exposure to a PTE within the past 12 months. However, the association between living arrangement and exposure to a single PTE failed to reach statistical significance after adjusting for all other socio-demographic variables. Additionally, men whose mothers had completed primary school were less likely to experience a PTE over the last 12 months than those whose mothers had a high school/university level of education. After adjustment, this association was also identified for participants whose mothers completed secondary vocational school. Age, linguistic region, paternal education and family affluence were not related to trauma exposure over the past 12 months. Unadjusted and adjusted ORs and 95% CI for experiencing any PTE during the subjects' lifetime and over the past 12 months are presented in Table 2.

3.3.2. Multiple types of PTEs

The associations between each of the socio-demographic variables of interest and experiencing multiple types of PTEs in one's lifetime were similar to those observed for the exposure to any PTE, except that there was no significant association between linguistic region and experiencing multiple types of PTEs. Additionally, after adjusting for all other socio-demographic variables, compared to a high school/university level education, only a primary school level education was associated with exposure to multiple types of PTEs. The relationship between each of the socio-demographic variables and reporting exposure to multiple types of PTEs over the past 12 months were also comparable to those observed for exposure to a single PTE. The only exception was linguistic region, for which a positive association was detected, meaning

Table 2. Logistic regression analysis for any PTE experienced during the subjects' lifetime and over the past 12 months.

| Any PTE | Lifetime prevalence | | 12-month prevalence | |
|--|---------------------|-------------------------------|---------------------|-------------------------------|
| | N = 5,035 | | N = 1,572 | |
| | Unadjusted OR [CI] | Adjusted OR [CI] ^a | Unadjusted OR [CI] | Adjusted OR [CI] ^a |
| <i>Socio-demographic factors</i> | | | | |
| Age^b | | | | |
| <21 | 1.00 | 1.00 | 1.00 | 1.00 |
| ≥21 | 1.08 [0.96–1.2] | 1.11 [0.99–1.25] | 1.03 [0.91–1.16] | 0.98 [0.87–1.11] |
| Linguistic region^b | | | | |
| German | 1.00 | 1.00 | 1.00 | 1.00 |
| French | 0.81 [0.72–0.9]*** | 0.78 [0.69–0.89]*** | 1.02 [0.9–1.15] | 1.05 [0.92–1.2] |
| Participant's education^b | | | | |
| –High school/university | 1.00 | 1.00 | 1.00 | 1.00 |
| –Secondary vocational school | 1.21 [1.07–1.36]** | 1.18 [1.04–1.34]** | 1.37 [1.21–1.55]*** | 1.42 [1.24–1.62]*** |
| –Primary school | 1.28 [1.03–1.58]* | 1.28 [1.03–1.6]* | 1.64 [1.32–2.04]*** | 1.67 [1.34–2.08]*** |
| Mother's education^c | | | | |
| –High school/university | 1.00 | 1.00 | 1.00 | 1.00 |
| –Secondary vocational school | 0.83 [0.72–0.95]** | 0.76 [0.66–0.89]*** | 0.93 [0.81–1.07] | 0.83 [0.71–0.97]* |
| –Primary school | 0.77 [0.63–0.93]** | 0.71 [0.57–0.9]** | 0.77 [0.63–0.95]* | 0.63 [0.49–0.81]*** |
| Father's education^c | | | | |
| –High school/university | 1.00 | 1.00 | 1.00 | 1.00 |
| –Secondary vocational school | 0.98 [0.87–1.11] | 1.02 [0.89–1.17] | 1.09 [0.96–1.24] | 1.08 [0.93–1.25] |
| –Primary school | 0.87 [0.71–1.07] | 0.91 [0.71–1.16] | 1.02 [0.82–1.27] | 1.08 [0.84–1.4] |
| Family affluence^c | | | | |
| –Above average | 1.00 | 1.00 | 1.00 | 1.00 |
| –Average | 0.95 [0.84–1.07] | 0.98 [0.86–1.12] | 1.02 [0.9–1.16] | 0.97 [0.85–1.12] |
| –Below average | 1.27 [1.07–1.51]** | 1.24 [1.03–1.49]* | 1.18 [0.98–1.41] | 1.12 [0.92–1.35] |
| Living arrangement^c | | | | |
| –Biological parents | 1.00 | 1.00 | 1.00 | 1.00 |
| –Others | 1.43 [1.24–1.65]*** | 1.4 [1.21–1.62]*** | 1.23 [1.06–1.42]** | 1.15 [0.99–1.33] |

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

OR: Odds ratio; CI: 95% confidence interval; PTE: potentially traumatic event; ^aAdjusted for all socio-demographic variables; ^bVariable was assessed during wave 2; ^cVariable was assessed during wave 1.

that participants in French-speaking regions were more likely to report exposure to multiple types of events than those from German-speaking regions. Unadjusted and adjusted ORs and 95% CI for experiencing multiple types of PTEs during the subjects' lifetime and over the past 12 months are shown in Table 3.

3.4. Mental health outcomes

Among subjects reporting any PTE within the last 12 months, 39.4% reported a pattern suggesting AUD, 4.5% symptoms suggesting MD, and 2.2% a suicide attempt. All of these rates were even higher among conscripts reporting multiple types of PTEs over the preceding 12 months: among them, 41.8% reported a pattern suggesting AUD, 10.0% symptoms suggesting MD, and 9.1% a suicide attempt. Logistic regression analysis identified trauma exposure as significantly associated with all three outcomes. Unadjusted and adjusted (for socio-demographic variables) ORs for these mental health outcomes are presented in Table 4.

4. Discussion

We found that exposure to PTEs is common among young Swiss men, with more than half of individuals (59.4%) having experienced one PTE and over one-third (37.3%) multiple types of PTEs in their lifetime. This finding concurs with previous estimates for high-income European countries (range 54.0% to 72.7%) that were reported in the context of a large

cross-national study encompassing 24 countries across six continents (Benjet et al., 2016). In this investigation, a wide range of PTEs was evaluated using uniform measurements across countries, providing highly representative estimates. In addition, our results show that a considerable number of men who reported exposure to PTEs in their lifetime experienced these events during the last 12 months; that is, half of the men reporting a single PTE (1,572 of 2,991) and one-third of men reporting multiple types of events (640 of 1,879). Given the age range of our sample (19 to 30 years), the aforementioned subjects were exposed to these events as young adults. This supports previous reports showing that young adulthood is indeed a vulnerable period for PTE exposure (Amstadter et al., 2013; Benjet et al., 2016; Hatch & Dohrenwend, 2007; Jaen-Varas et al., 2016).

Furthermore, despite their youth, most participants reporting PTE exposure (1879 of 2991) have already experienced more than one type of event. Exposure to multiple types of events has been associated with a higher risk of several unfavourable outcomes, including poor mental and physical health and reduced quality of life (Agorastos et al., 2014; Amstadter et al., 2013; Kilpatrick et al., 2013; Landolt et al., 2013; LeBouthillier et al., 2015; Suliman et al., 2009). Moreover, an increasing number of PTEs may result in more complex and severe psychiatric conditions (Agorastos et al., 2014; Landolt et al., 2013; Suliman et al., 2009). Considering these previous findings, the high frequency of exposure to multiple types of events already experienced by our

Table 3. Logistic regression analysis for multiple types of PTEs experienced during the subjects' lifetime and over the past 12 months.

| Multiple types of PTEs | Lifetime prevalence | | 12-month prevalence | |
|--|---------------------|-------------------------------|---------------------|-------------------------------|
| | N = 1879 | | N = 640 | |
| | Unadjusted OR [CI] | Adjusted OR [CI] ^a | Unadjusted OR [CI] | Adjusted OR [CI] ^a |
| <i>Socio-demographic factors</i> | | | | |
| Age^b | | | | |
| <21 | 1.00 | 1.00 | 1.00 | 1.00 |
| ≥21 | 1.12 [1.00–1.25] | 1.12 [0.99–1.26] | 1.17 [0.99–1.38] | 1.07 [0.9–1.27] |
| Linguistic region^b | | | | |
| German | 1.00 | 1.00 | 1.00 | 1.00 |
| French | 0.95 [0.85–1.06] | 0.92 [0.81–1.04] | 1.28 [1.08–1.51]** | 1.27 [1.05–1.52]* |
| Participant's education^b | | | | |
| –High school/university | 1.00 | 1.00 | 1.00 | 1.00 |
| –Secondary vocational school | 1.14 [1.01–1.28]* | 1.11 [0.98–1.27] | 1.35 [1.13–1.61]*** | 1.44 [1.19–1.73]*** |
| –primary school | 1.37 [1.11–1.69]** | 1.32 [1.07–1.64]* | 1.56 [1.17–2.09]** | 1.56 [1.16–2.10]** |
| Mother's education^c | | | | |
| –High school/university | 1.00 | 1.00 | 1.00 | 1.00 |
| –Secondary vocational school | 0.86 [0.75–0.98]* | 0.81 [0.7–0.94]** | 0.83 [0.69–1.01] | 0.73 [0.59–0.90]** |
| –Primary school | 0.84 [0.69–1.02] | 0.74 [0.59–0.94]* | 0.69 [0.51–0.93]* | 0.57 [0.40–0.80]** |
| Father's education^c | | | | |
| –High school/university | 1.00 | 1.00 | 1.00 | 1.00 |
| –Secondary vocational school | 1 [0.89–1.13] | 1.02 [0.89–1.18] | 1.13 [0.94–1.35] | 1.13 [0.92–1.38] |
| –Primary school | 1 [0.81–1.23] | 1 [0.78–1.28] | 0.93 [0.68–1.27] | 0.95 [0.66–1.37] |
| Family affluence^c | | | | |
| –Above average | 1.00 | 1.00 | 1.00 | 1.00 |
| –Average | 0.95 [0.84–1.08] | 0.94 [0.82–1.07] | 1.17 [0.97–1.4] | 1.07 [0.88–1.3] |
| –Below average | 1.44 [1.21–1.71]*** | 1.35 [1.13–1.62]*** | 1.22 [0.95–1.56] | 1.16 [0.89–1.51] |
| Living arrangement^c | | | | |
| –Biological parents | 1.00 | 1.00 | 1.00 | 1.00 |
| –Others | 1.52 [1.33–1.75]*** | 1.45 [1.26–1.67]*** | 1.34 [1.11–1.62]** | 1.21 [0.99–1.48] |

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

OR: Odds ratio; CI: 95% confidence interval; PTE: potentially traumatic event; ^aAdjusted for all socio-demographic variables; ^bVariable was assessed during wave 2; ^cVariable was assessed during wave 1.

Table 4. Mental health outcomes associated with any or multiple types of PTEs experienced in the past 12 months.

| | AUD ^a N = 1643 | |
|---|--|-------------------------------|
| | Unadjusted OR [CI] | Adjusted OR [CI] ^b |
| Any PTE^a | 1.67 [1.47–1.89]*** | 1.71 [1.50–1.94]*** |
| Multiple types of PTEs^a | 1.59 [1.22–2.1]*** | 1.64 [1.25–2.15]*** |
| | MD ^a N = 147 | |
| | Unadjusted OR [CI] | Adjusted OR [CI] ^b |
| Any PTE^a | 2.06 [1.48–2.87]*** | 1.94 [1.39–2.72]*** |
| Multiple types of PTEs^a | 2.41 [1.65–3.54]*** | 2.26 [1.53–3.34]*** |
| | Suicide attempt ^a N = 61 | |
| | Unadjusted OR [CI] | Adjusted OR [CI] ^b |
| Any PTE^a | 3.01 [1.81–5.02]*** | 2.72 [1.62–4.56]*** |
| Multiple types of PTEs^a | 5.27 [3.15–8.81]*** | 4.94 [2.92–8.35]*** |

Note. †p < .10, *p < .05, **p < .01, ***p < .001.

OR: Odds ratio; CI: 95% confidence interval; PTE: potentially traumatic event; AUD: alcohol use disorder; MD: major depression; ^aVariable was assessed during wave 2; ^bAdjusted for all socio-demographic factors.

young adults is alarming. Prevention is crucial; and to prevent the development of such outcomes and related negative consequences during later phases of life, further efforts must be undertaken to reduce exposure to PTE in young adults.

Relative to pre-existent lifetime prevalence estimates for Switzerland, our rates are twice as high as those reported by Hepp et al. (2006), but similar to those reported by Landolt and colleagues (Landolt et al., 2013). The inconsistency between our estimates and those reported by former of these two studies could be the result of differences in cohort characteristics. For instance, the investigation by Hepp et al. (2006) included subjects from both genders and data were collected only from one Swiss canton, while our sample only included men but covered most of the country's cantons. Thus, the results of these two studies may not be fully comparable. Furthermore, Hepp et al. (2006) used data obtained in 1993 and 1999 when the participants were in their thirties and forties and were, therefore, about 20 to 30 years older than those in our sample. Since then, the number of people who have been naturalised in Switzerland has increased significantly (State Secretariat for Migration [SEM], 2018); thus, even though both studies used data only from Swiss nationals, it is possible that more of our participants had immigrated from countries with a higher risk of PTE exposure. In fact, while none of the participants in the investigation by Hepp and colleagues (Hepp et al., 2006) reported having been exposed to war-related events or natural disasters, which are rare to non-existent in Switzerland, in the present study several men reported past exposure to such events. Additionally, non-Swiss nationality has previously

been associated with a higher risk of trauma exposure (Landolt et al., 2013). Therefore, the 'indirect' inclusion of men who had immigrated from other countries may have contributed to the higher rates in our study.

Consistent with previously reported findings (Benjet et al., 2016; Hepp et al., 2006; Jaen-Varas et al., 2016; Netto et al., 2013; Pietrzak et al., 2011) we found that fearing that they themselves or someone else might be killed or severely injured, being exposed to serious accidents, experiencing a serious injury, life-threatening illness or the unexpected death of a loved one, physical assault by a stranger and witnessing a severe injury or death were the most common traumatic events reported by young Swiss men. In contrast, torture and sexual assault, either by a family member or stranger, were the most infrequent events reported by our sample. Torture has also been rarely reported in most other countries (for an overview of prevalence rates across multiple countries, see (Benjet et al., 2016)). Sexual assault is usually more frequent in women than men (Hepp et al., 2006; Overstreet, Berenz, Kendler, Dick, & Amstadter, 2017; Perkonig et al., 2000). Thus, our findings can be explained by the inclusion of men only.

4.1. Socio-demographic factors

Contrary to earlier findings (Benjet et al., 2016; Fetzner et al., 2011; Hatch & Dohrenwend, 2007; Jaen-Varas et al., 2016), we noted no significant associations between age and lifetime or 12-month prevalence of exposure to one or multiple types of PTEs. This inconsistency might be due to the narrow age range of our sample. Indeed, these previous studies investigated subjects of various age categories (e.g., including adolescents, young adults, middle-aged adults and/or elderly), while our study only included young adults (ages 19 to 30 years old). This assumption is supported by an investigation by Amstadter and colleagues (Amstadter et al., 2013), who studied subjects with a similar age range (19 to 36 years) and also failed to identify any significant relationship between age and the prevalence of PTE exposure.

For linguistic region, we found somewhat contradictory results. German-speaking conscripts exhibited a higher lifetime prevalence of exposure to a single event, while French-speaking men had a higher risk of experiencing multiple types of PTEs within the last 12 months. We suspect that these linguistic associations might reflect cultural differences in response behaviours. For instance, men from the French-speaking region tended to give more extreme responses than those from the German-speaking region, a finding that has been reported for other previous investigations using the same dataset (Dey,

Gmel, & Mohler-Kuo, 2013; Estévez et al., 2014). This was true for several outcomes over the 12 months prior to the investigation. In the context of PTEs, French-speaking conscripts might be more prone to report and acknowledge recent events as being stressful or traumatic than those who speak German, resulting in a higher percentage claiming to have experienced multiple types of PTEs. However, since, to our knowledge, no studies have yet identified any similar relationship between linguistic regions and PTE exposure, further research is needed to provide a conclusive explanation for these findings.

Relative to men who had completed high school or attended university, those with a primary or secondary vocational school level education were more likely to report having experienced one or even multiple types of PTEs at some time in their life or within the past 12 months. These findings are consistent with numerous previous reports that revealed a positive association between low education level and PTE exposure (Amstadter et al., 2013; Benjet et al., 2016; Breslau, Davis, Andreski, & Peterson, 1991; Breslau et al., 1998; Darves-Bornoz et al., 2008; Hepp et al., 2006; McLaughlin et al., 2013; Netto et al., 2013; Perkonig et al., 2000). The subject's education level thereby seems to be a key target for prevention. Efforts should be intensified to provide strategies and counselling aimed at preventing PTEs in individuals with a low education level and/or to help them cope with the consequences of being exposed to such events.

We found that young men whose mothers had a high school or university education were more likely to report having been exposed to one or more traumatic events at some time in their life or over the past 12 months. In contrast, paternal education level was unrelated to PTE exposure. Both results stand in contrast with prior studies, which identified a significant link between low parental education and exposure to traumatic events (Landolt et al., 2013; Netto et al., 2013; Perkonig et al., 2000). In particular, the observation that higher maternal education was associated with greater prevalence of PTE exposure was unexpected. One possible explanation for this is that mothers with a lower education might be less likely to engage in out-of-home employment, and, therefore, be more available to supervise their children, limiting the children's exposure to PTEs. However, given that we did not collect information about maternal employment or supervision, we cannot test this assumption. Alternatively, mothers with a high education may have been more aware of the significance and possible consequences of experiencing PTEs and then transferred that recognition onto their offspring, making them more

likely to report their experiences with traumatic events. Indeed, more-educated mothers appear to be more aware of their offspring's (psychiatric) problems (Gau et al., 2010). Thus, the observed association may reflect differences in reporting such events.

Family affluence and living arrangement also were associated with exposure to PTEs, with subjects who reported family incomes below average and those not living with their biological parents before the age of 18 exhibiting elevated odds of exposure to one or multiple types of events in their lifetime. However, it must be noted that these family characteristics were unrelated to PTE exposure over the preceding 12 months. Given the age range of our participants, the 12-month prevalence was assessed in men who were 19 years or older, while the assessment of lifetime prevalence also included reporting of PTE exposure during childhood and adolescence. These particular characteristics may, therefore, play major roles during earlier stages of life. In particular, not living with both biological parents has been consistently reported to be linked to PTEs in previous studies on children and adolescents (Landolt et al., 2013; McLaughlin et al., 2013; Mohler-Kuo et al., 2014). In this context, it has been hypothesized that individuals not living with their biological parents might be less well looked after, increasing their risk of exposure to traumatic events (Landolt et al., 2013). With respect to family affluence, previous reports also concur with our findings (Hepp et al., 2006; McLaughlin et al., 2013; Perkonig et al., 2000). It is possible that limited opportunities and resources in families with low socio-economic status may lead to a higher risk of exposure to traumatic events during childhood and adolescence, including violence within the family or neighbourhood (Hatch & Dohrenwend, 2007).

4.2. Mental health outcomes

Consistent with prior reports (Amstadter et al., 2013; Asselmann, Wittchen, Lieb, Perkonig, & Beesdo-Baum, 2018; Fetzner et al., 2011; Jaen-Varas et al., 2016; Kessler et al., 1995; LeBouthillier et al., 2015; Löwe et al., 2011; Netto et al., 2013; Park et al., 2015; Perkonig et al., 2000; Pietrzak et al., 2011) we found that, in young men, PTE exposure is associated with AUD, MD and attempted suicide. In addition, men reporting multiple types of PTEs had approximately five times the odds of reporting suicide attempts as those reporting no PTEs. A higher risk of suicide attempts among subjects experiencing multiple types of PTEs is consistent with what others have reported (LeBouthillier et al., 2015; Park et al., 2015). This finding is of particular clinical interest, considering that suicide is one of the most common causes of death among young men (Pitman, Kryszka,

Osborn, & King, 2012). Furthermore, experiencing mental health issues at this young age is especially problematic. For instance, impairment associated with AUD and MD or consequences of a suicide attempt may make it more difficult for young adults to address the new challenges that arise during this critical life stage, resulting in adverse effects during later phases of life; for example, dropping out of school prematurely may lead to low socio-economic status in adulthood (Breslau, Lane, Sampson, & Kessler, 2008). Moreover, the presence of these mental health outcomes, in particular AUD and MD, may further increase a person's risk of PTE exposure (Amstadter et al., 2013; Perkonig et al., 2000). For example, excessive consumption of alcohol in the context of AUD may lead to a higher risk of exposure to dangerous situations (Jaen-Varas et al., 2016). This may result in people more often experiencing multiple types of PTEs which could, in turn, increase their likelihood of other problematic health outcomes (Park et al., 2015). Together, these findings highlight the need for strategies designed to prevent exposure to PTEs and the development of these mental health problems, as well as strategies to treat any impairment associated with these outcomes in young men who have experienced PTEs.

4.3. Study limitations

The following limitations of this study must be considered. First, we present rates of exposure to PTEs among young men only; as such, the results cannot be generalised to other populations. Second, true prevalence rates might have been significantly altered by recall bias, especially regarding events experienced in the distant past, including early childhood. Third, not all subjects responded to all questions, so some data were lost; this being said, PTE data regarding traumatic events were provided by 5,035 of 5,223 subjects (96.4%), and the overall response rate in the C-SURF study overall was quite satisfactory (Studer et al., 2013). Fourth, the variety of PTEs that have been examined renders some inter-study comparisons difficult, especially since different studies used different assessment tools. However, we included an open-ended question to capture events other than the ones listed, and this option was used by 10.5% of the subjects. In addition, combining the three scales – the PDS, THQ and LEC – generated a very broad level of assessment. Fifth, the socio-demographic parameters and mental health outcomes we examined, had all been pre-selected in the context of C-SURF. Other common psychiatric disorders, like anxiety or post-traumatic stress disorders, might be present in some subjects who reported exposure to PTEs and perhaps influenced our results. Sixth, since data on

PTE exposure and mental health outcomes were collected at the same time point (i.e., in wave 2), we cannot draw any causal inferences. Seventh, all data were self-reported. We, therefore, cannot confirm the clinical diagnosis of any of the mental health outcomes reported.

In conclusion, we found that exposure to PTEs is common among young Swiss men, with more than one-third having already experienced multiple types of events at a young age (i.e., by the time they reach their early twenties). In addition, our findings show that, in young adults, exposure to PTEs is associated with AUD, MD and suicide attempts. For men who experience multiple types of events, the association with suicide attempts was particularly strong. Preventive strategies to reduce PTE exposure and circumvent the development of such outcomes in young adults are crucial to help them avoid negative consequences during later phases of life. Considering the youth of our subjects, such strategies may be more successful when administered before early adulthood.

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Availability of data and materials

The raw data assessed in the context of C-SURF and the questionnaires used are available on <http://www.c-surf.ch/en/30.html>.

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