Frequency of trauma exposure and Post-Traumatic Stress Disorder in Italy: analysis from the World Mental Health Survey Initiative

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ABSTRACT

Epidemiological studies have examined the relative importance of Traumatic Events (TEs) in accounting for the societal burden of post-traumatic stress disorder (PTSD). However, most studies used the worst trauma experienced, which can lead to an overestimation of the conditional risk of PTSD. Although a number of epidemiological surveys on PTSD have been carried out in the United States, only a few studies in limited sample have been conducted in Italy.

This study, carried out in the framework of the World Mental Health Survey Initiative, is a cross-sectional household survey of a representative sample of the Italian adult population. Lifetime prevalence of TEs and 12-month prevalence of PTSD were evaluated using the Composite International Diagnostic Interview (CIDI). Reports of PTSD associated with randomly selected TEs were weighted by the individual-level probabilities of TE selection to generate estimates of population-level PTSD risk associated with each TE. Network events was the most commonly reported class of TEs (29.4%). War events had the highest conditional risk of PTSD (12.2%). The TEs that contributed most to societal PTSD burden were unexpected death of a loved one (24.1%) and having seen atrocities (18.2%). Being female was related to high risk of PTSD after experiencing a TE. Exposure to network events is commonly reported among Italian adults, but two TEs are responsible for the highest burden associated with PTSD: the unexpected death of someone close and sexual assault. These results can help designing public health interventions to reduce the societal PTSD burden.

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1. Objectives of the study and background

Post-Traumatic Stress Disorder (PTSD) is a debilitating anxiety disorder that has raised increasing interest in psychiatry since its first introduction in the DSM-III (APA, 1980). Community surveys suggest that, while 50—85% of Americans will experience a traumatic event (TE) in their lifetime, only 2—50% will develop PTSD (Alonso et al., 2002). Clinical studies have also shown that traumatized patients have generally experienced several TEs in their lifetime (APA, 1980), but still today, the reasons why some individuals develop PTSD following trauma exposure, while others remain resilient, is a central question in the field of trauma research. Although a number of epidemiological surveys on PTSD have been carried out in the United States, there have been few community studies in Europe.

In Italy, only a few studies conducted in geographically limited samples have provided some estimates on PTSD (Carmassi et al., 2013, 2014; Craparo et al., 2013; Dell'Osso et al., 2011; Faravelli et al., 2004a, 2004b; Favaro et al., 1999, 2000; Gigantesco et al., 2006); however, given the specific characteristics of each of these samples, it is difficult to generalize their results to the overall general population of the country. The European Study of the Epidemiology of Mental Disorders (ESEMeD) is the first multinational study conducted in Europe and is part of the WHO World Mental Health Survey Initiative (ESEMeD-WMH). It included 21,425 adults randomly selected in six European Countries (e.g., Spain, Italy, Germany, the Netherlands, Belgium and France) (Darves-Bornoz et al., 2008; de Girolamo et al., 2006a, 2006b; Kessler, 2007). The present study reports on the prevalence of trauma

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exposure and risk of PTSD associated with TEs in the Italian population enrolled in the ESEMeD-WMH. In particular, the aims of the current study were to investigate: the frequency of TEs; the conditional prevalence of DSM-IV/Composite International Diagnostic Interview (CIDI) PTSD after exposure to a TE; and the relative burden of PTSD referred to the total number of months (or years) with PTSD in the population (derived from the combination of three factors that are the prevalence of the event, the conditional risk of PTSD and the PTSD duration). This is the first report to describe the public health burden of TEs and PTSD in Italy.

2. Materials and methods

2.1. Sample

The ESEMED-WMH (Alonso et al., 2002, 2004a) was carried out between January 2001 and July 2003 (Demyttenaere et al., 2004) and was aimed at establishing prevalence estimates of mental disorders (except psychotic disorders) and at identifying risk factors for these disorders. It was a cross-sectional, face-to-face, household survey of probability samples of the adult population, and in Italy it represented the first Italian nationwide study to estimate the 1-month, 12-month and lifetime prevalence rates and socio-demographic correlates of mood, anxiety and substance/alcohol disorders. The rationale and survey methods have been described in several previous publications (Alonso et al., 2002, 2004b) and are only briefly summarized here. Ethical approval was provided by the Italian National Institutes of Health, which coordinated the survey.

The study population included the non-institutionalized Italian adult population (aged 18 years or older) of Italy in 1998 ($N = 47,271,862$). The investigation was carried out in accordance with the latest version of the Declaration of Helsinki, the study design was reviewed by an appropriate ethical committee, and informed consent of the participants was obtained after the nature of the procedures had been fully explained.

Respondents were selected using a multi-stage area probability sample design. A detailed description of the sampling procedure has been presented elsewhere (Alonso et al., 2002, 2004b; de Girolamo et al., 2006a, 2006b). The distribution of subjects by region in the proposed sample was representative of the distribution of the adult population across Italy.

The demographic characteristics of the overall sample have been previously described (de Girolamo et al., 2006a, 2006b). Briefly, 4,712 subjects were interviewed, with an overall response rate of 71.3%, higher than the average response rate in the overall European sample (61.2%). All interviews took place in the respondents' homes and were conducted face-to-face by trained lay interviewers using a computer-assisted personal interview. To reduce respondent burden, only part of the questionnaire was administered to all participants, the questionnaire being split into two parts (Alonso et al., 2004b). All respondents completed questions in Part 1 (demographic information, suicide attempts, depressive and anxiety disorders, and alcohol use). Part 2 questions (PTSD and chronic conditions) were administered to both Part 1 respondents who were at high risk for any lifetime depressive or anxiety disorder and a 25% random selection of the rest of the respondents. The Part 2 sample included 1,779 respondents: analyses presented in this article are based on this weighted Part 2 sample. Additional weights were used to adjust for differential probabilities of selection within households, adjust for non-response and to match the samples to population socio-demographic distributions.

2.2. Assessment measures: trauma exposure

The study assessed lifetime occurrence of the 27 TEs included in the CIDI DSM-IV PTSD module (Kessler and Ustun, 2004). TEs were categorized into seven classes as follows: *war events* (combat experience, relief worker in war zone, civilian in war zone, civilian in region of terror, refugee, purposely injured, tortured or killed someone, and saw atrocities), *physical violence* (kidnapped, beaten up by caregiver, beaten up by spouse or romantic partner, beaten up by someone else, and mugged or threatened with a weapon), *sexual violence* (raped, sexually assaulted, and stalked), *accidents* (toxic chemical exposure, automobile accident, other life-threatening accident, natural disaster, man-made disaster, and a life-threatening illness), *unexpected death of a loved one*, *network events* (child with a serious illness, traumatic event to a loved one, witnessed death/dead body, or saw someone hurt, and accidentally caused serious injury or death) and *others* (some other event, and private event). The final category of *others* included an additional question which inquired about other TEs not included in the CIDI list and a final open-ended question asked information about qualifying TEs that respondents did not report because of embarrassment (coded as 'Private events').

2.3. PTSD assessment

DSM-IV requires PTSD to be assessed in relation to exposure to a qualifying TE. However, as most ESEMeD respondents reported lifetime exposure to multiple TEs and some respondents reported exposure to a very large number of TEs, it was not possible to carry out a separate assessment of PTSD for each TE experienced by every respondent. This problem is typically addressed in community epidemiologic surveys by asking respondents to nominate the worst TE they ever had in their lifetime and using that one TE as the focus of PTSD assessment. However, as shown elsewhere, this approach leads to bias in estimating conditional risk of PTSD as well as in estimating the distribution of PTSD across TE types due to the fact that worst TEs are not representative of all TEs (Breslau et al., 1998). This problem was solved in the WMH Survey Initiative by assessing PTSD for two TEs: the one nominated by the respondent as their worst lifetime TE and another TE selected at random from among the respondent's other lifetime TEs. By weighting data on symptoms associated with the latter TEs by the number of lifetime TEs each respondent reported having, we were able to construct a weighted TE-level dataset that accurately represents all TE that ever occurred to all respondents. Unlike datasets based only on information about worst TEs, this weighted dataset of randomly selected TEs can be used to obtain unbiased estimates of PTSD conditional prevalence and distribution across all TEs in the population.

All criteria for PTSD were assessed for each TE assessed with no skip-outs. Respondents were also asked how persistence of PTSD symptoms was associated with each sampled TE.

2.4. Socio-demographic correlates

Five socio-demographic variables were included in the analysis: gender, age, marital status, education and employment status as shown in Table 1. Age consisted of four categories (years): 18–34, 35–44, 45–59, and 60 or older. Marital status was categorized into three groups: married, previously married and never married. Education was classified depending on the number of years of formal schooling into three categories: low (0–1 year), low-average (2–7 years), high (8 or more years). Employment status consisted of four categories: employed, homemaker, retired and other (including unemployed and students). Socio-demographic variables with multiple categories were dummy coded for analytic purposes

Table 1
Sociodemographic characteristics of the Italian sample.

	Total sample (N = 1,779)	%	Standard error
Gender			
Male	809	47.97	1.47
Female	970	52.03	1.47
Age			
18–34 years	496	29.15	1.34
35–44 years	357	18.15	0.85
45–59 years	473	23.47	1.30
60+ years	453	29.24	1.54
Marital Status			
Married	1206	66.72	1.63
Previously married	149	8.27	0.97
Never married	424	25.01	1.41
Educational Level			
Low	418	25.18	1.28
Low-average	365	21.73	1.37
High-average	618	33.78	1.81
High	378	19.31	1.22
Employment			
Employed	982	53.91	1.67
Homemaker	218	11.99	1.02
Retired	377	23.95	1.33
Other	202	10.14	0.88

(reference groups include Male, Age 60+, Married, High education, and Employed).

2.5. Statistical analyses

Prevalence of TE exposure and conditional prevalence of PTSD given TE exposure were examined using cross-tabulations. A series of four logistic regression models (Hosmer and Lemeshow, 2000) were then used to examine the predictors of lifetime and 12-month PTSD. For lifetime PTSD, the first model examined its socio-demographic predictors in the population. The second model examined the socio-demographic predictors of exposure to any traumatic event in the total sample while the third model examined predictors of lifetime PTSD among those with exposure to at least one event. The final model was similar to the third, but additionally controlled for the type of TEs and prior exposure to TEs.

A similar set of models was then estimated to study socio-demographic predictors of 12-month PTSD among lifetime cases with an additional model controlling for lifetime PTSD. For 12-month PTSD, in fact, the first model examined the socio-demographic predictors in the total population, while the second one examined predictors of 12-month PTSD among those with TEs exposure. The third model was similar to the second but additionally controlled for the type of TEs and prior exposure to TEs. The final model examined the predictors of 12-month PTSD among those with lifetime PTSD, controlling for both TE exposure and prior TEs.

The logistic regression coefficients and their standard errors were calculated and are reported here as Odds Ratios (ORs) with 95% confidence intervals. To adjust for the weighting and clustering of the ESEMeD-WMH data, Standard Errors (SE) were estimated using the Taylor series method (Wolter, 1985) implemented in the SUDAAN software system. Multivariate significance was evaluated with Wald χ^2 tests based on design-corrected coefficient variance-covariance matrices. Statistical significance was consistently evaluated using 0.05 level two-sided tests.

3. Results

3.1. Socio-demographic characteristics of the Italian sample

A total of 1,799 subjects met the study entry criteria. The sample mean age was 47.7 years (SE = 0.6). Most participants were women

(N = 970, 52.0%), 29.1% were aged 18–34, 18.1% were aged 35–44, 23.5% were aged 45–59, and 29.2% were older than 60 years old. Some 66.7% (N = 1,206) were married. Educational level was low for 25.2% (N = 418) of the sample and most participants were currently employed (N = 982, 53.9%).

3.2. TE exposure in the Italian sample

Prevalence (SE) of exposure to at least one lifetime TE was 56.1% (2.2) in the total sample, while the average person exposed to any lifetime TE reported an average of 4.0 occurrences, for a total of approximately 3,992 lifetime TEs experienced by the 1,779 ESEMeD Italian respondents (Table 2). The TE class reported by the highest proportion of respondents was *network events* (29.4%) followed by *accidents* (25.8%), *unexpected death of a loved one* (20.4%), and *physical violence* (9.9%). Mean number of occurrences varied significantly across TEs classes ($\chi_6 = 244.9$, $p < .001$), resulting in the highest proportion of all lifetime TEs being associated with *network events* (47.5%) followed by *accidents* (22.0%), *unexpected death of a loved one* (13.3%) and *physical violence* (6.4%) (Fig. 1).

3.3. Prevalence and conditional risk of PTSD

Conditional prevalence of PTSD refers to the prevalence of PTSD among those that have been exposed to TEs, as opposed to the prevalence of PTSD in the total sample that includes those that were not exposed to any TE.

The conditional prevalence of DSM-IV/CIDI PTSD after exposure to a TE averages 2.5% (1.2) across all TEs, for a total of approximately 101 lifetime episodes of PTSD (i.e., 2.5% of approximately 3992 TE occurrences) among ESEMeD respondents. One or more lifetime episodes of PTSD was reported by 2.4% (0.6) of respondents, although this is an under-estimate to an unknown degree of the proportion of respondents with lifetime PTSD since we did not assess PTSD for every TE reported by every respondent. The prevalence estimate of 12-month PTSD, in comparison, is 0.7% (0.2).

As shown in Table 3, conditional risk for PTSD associated with TEs classes ranges from a high of 12.2% (4.9) associated with *war events* to a low of 0.8% (0.5) associated with *sexual violence* varying significantly across broad TEs classes ($\chi_6 = 2.3$, $p = .049$). Conditional PTSD risk varies even more across specific TEs, with the highest value associated with saw atrocities (100%) and being beaten up by partner (30.6%), with this variation being also statistically significant ($\chi_2 = 2.4$, $p = .006$). The next highest conditional risks are associated with private event (13.5%) and child with serious illness (12.5%). Conditional risks associated with the other 22 TEs types are considerably lower (0.0–5.3%).

Once PTSD occurs, PTSD duration varies significantly depending on the TEs implicated in the PTSD (for TEs classes: $\chi_6 = 134.2$, $p < .001$; for individual TEs: $\chi_{11} = 29.8$, $p < .001$). Mean duration (SE) for all PTSD episodes is 127.3 (114.7) months. There is little precision in studying between-TE variation in mean duration due to the small numbers of respondents with PTSD associated with specific TEs.

The relative burden of PTSD refers to the total number of months (or years) with PTSD in the population (or per 100 persons). The relative burden is a combination of three factors: the prevalence of the event, the conditional risk of PTSD and the PTSD symptom duration. For individual events, the highest burden is associated with unexpected death of a loved one (24.1%), and having seen atrocities (18.2%). Each of these events imposes high burden for different reasons: for example, death is one of the most common events, with 20.4% prevalence rate; however the probability of

Table 2
Prevalence of trauma exposure in the Italian sample (n = 1,779).

Event type	Prevalence %	SE	Mean number of occurrences[a]	SE	Proportion of traumas in population[b]	SE
War Events	6.9	0.72	1.4	0.13	4.3	0.49
• Combat experience	1.0	0.34	1.0	0.00	0.4	0.15
• Relief worker in war zone	0.8	0.32	1.0	0.00	0.3	0.14
• Civilian in war zone	4.6	0.66	1.0	0.00	2.1	0.33
• Civilian in region of terror	1.1	0.29	1.0	0.00	0.5	0.12
• Refugee	0.5	0.22	1.0	0.00	0.2	0.09
• Purposely injured, tortured or killed someone	0.2	0.11	3.2	1.27	0.2	0.21
• Saw atrocities	0.5	0.24	2.1	0.86	0.5	0.22
Physical Violence	9.9	0.95	1.4	0.07	6.4	0.67
• Kidnapped	1.3	0.35	1.1	0.00	0.6	0.15
• Beaten up by caregiver	2.8	0.55	1.0	0.00	1.2	0.22
• Beaten up by spouse or romantic partner	1.1	0.28	1.0	0.00	0.5	0.12
• Beaten up by someone else	1.5	0.27	2.1	0.28	1.4	0.29
• Mugged or threatened with a weapon	4.7	0.67	1.3	0.09	2.7	0.46
Sexual Violence	3.7	0.56	2.1	0.20	3.4	0.48
• Raped	0.7	0.18	1.9	0.32	0.6	0.14
• Sexually assaulted	1.1	0.26	2.2	0.18	1.0	0.28
• Stalked	2.2	0.39	1.8	0.17	1.7	0.31
Accidents	25.8	1.92	1.9	0.11	22.0	1.63
• Toxic chemical exposure	1.8	0.44	3.6	0.39	3.0	0.79
• Automobile accident	11.7	1.16	1.3	0.05	6.6	0.70
• Other life threatening accident	2.9	0.54	1.4	0.14	1.8	0.35
• Natural disaster	7.8	1.29	1.4	0.13	4.9	0.81
• Man-made disaster	2.3	0.41	1.3	0.14	1.4	0.28
• Life-threatening illness	8.0	0.81	1.2	0.06	4.4	0.58
Unexpected death of loved one	20.4	1.16	1.5	0.05	13.3	0.92
Network events	29.4	2.11	3.6	0.24	47.5	2.65
• Child with serious illness	5.4	0.65	1.2	0.07	2.8	0.44
• Traumatic event to a loved one	0.7	0.18	1.1	0.08	0.3	0.09
• Witnessed death/dead body, or saw someone seriously hurt	25.4	2.23	3.9	0.26	44.1	2.89
• Accidentally caused serious injury or death	0.6	0.18	1.1	0.06	0.3	0.09
Others	7.0	0.76	1.0	0.02	3.2	0.36
• Some other event	2.5	0.54	1.0	0.00	1.1	0.23
• Private event	4.8	0.56	1.0	0.00	2.1	0.29
Total with any event	56.1	2.24	4.0	0.23	100.0	0.00

[a] Mean number of occurrences among respondents with any TE vary significant across the seven TE classes ($\chi_2 = 2449$, $p < 001$) as well as across the 27 individual TE types ($\chi_2 = 3079$, $p < 001$) Some classes of events are not included in the comparison because their number of mean occurrences is equal to zero.
[b] Events in this class as percentage of all traumatic events.

PTSD associated with death is only 4.6%, and the duration of PTSD episode associated with death is only 21.8 months. Despite the low conditional risk and relatively short duration compared to other events, *unexpected death of a loved one* contributes to the total burden because it is so common. Having seen atrocities, on the other hand, is not very common, and only 0.5% of respondents reported this event: however, the probabilities of PTSD (100%) and duration (600.0 months) associated with this event are high and, therefore, having seen atrocities contributes to almost one-fifth of the total PTSD burden.

The TEs class which accounted for the largest burden of PTSD, besides the unexpected death of a loved one, was *network events* (21.7%), which also accounted for the TEs class with the highest prevalence rate (29.4%) and included: child with serious illness, which was had a frequency of 5.4%, with a conditional risk of PTSD of 12.5% and a mean PTSD duration of 11.1 months; and witnessing a dead body or someone seriously hurt, which was quite frequent (25.4%) but had a low conditional risk of PTSD (0.4%) and a PTSD duration of 20 months. Overall these two classes account for almost 50% of the burden of PTSD in this population.

3.4. Socio-demographic predictors of trauma exposure, lifetime and 12-month PTSD

Trauma exposure, lifetime and 12-month PTSD were predicted by few socio-demographic factors (Table 4). The odds of trauma exposure were highest among never married (OR = 1.43), who were at significantly higher risk of exposure to TEs than married ones. Women (0.73), aged 18–34 (0.42) and 35–44 (0–41) years old, low (0.46) and low average (0.58) education were at significantly lower risk of exposure to TEs than men, older than 60 years old, and high average education respectively (Table 4).

For lifetime PTSD, women (OR = 5.26) and low education (OR = 5.33) had the highest odds ratio in fully adjusted models. For 12-month PTSD among those with lifetime PTSD, previously married participants had lower odds (OR = 0.01) compared to married respondents. Compared to those with high average/high education those with low-average education had significantly increased odds of having 12-month PTSD (OR = 7.61).

4. Discussion

This is the first study to report national estimates in Italy of trauma exposure across a full range of TEs and the PTSD prevalence rates related to such exposures. Our results show more than half of the Italian population to have been exposed to at least one TE (56.1%), with a conditional risk for PTSD ranging from 12.2% (war events) to 0.8% (sexual violence), and a mean duration of illness of more than 10 years.

4.1. How frequent is trauma exposure in the Italian sample?

Our exposure rates to at least one TE are slightly lower than those reported in the whole European sample of 8,797 subjects,
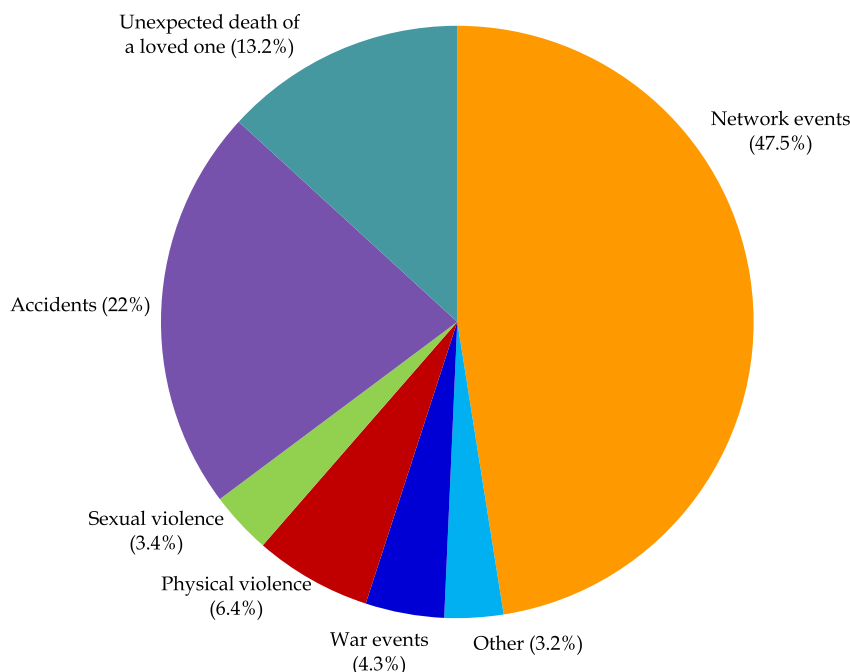
Fig. 1. Traumatic events by category as percentage of all traumatic events.

interviewed in the ESEMeD study, in which a percentage of 63.6% was found (Darves-Bornoz et al., 2008). Higher prevalence rates were also found globally among respondents from high income countries (Belgium, France, Germany, Israel, Italy, Japan, Netherlands, New Zealand, Spain and USA) involved in the WMH Survey Initiative (Karam et al., 2010) and, similarly, in the South Africa study of the same survey (Atwoli et al., 2013), named 'South African Stress and Health Study', rates as high as more than 70% were found. In our study, the average person exposed to any life-time TE reported an average of 4.0 occurrences, slightly lower than that globally reported (4.7) among ten high income countries enrolled in the WMH (Karam et al., 2010). Karam et al. (2014), analyzing data from 20 population surveys in the WMH Survey Initiative ($N = 51,295$), found that cases who associated their PTSD to four or more TEs presented a more complex clinical picture with substantially greater functional impairment and morbidity than other cases of PTSD. Analyzing the TEs recorded by people over 60 years, a probable war experience must be considered. In fact this subjects could be victims of different types of trauma during the Second World War.

4.2. Which events are most associated with the onset of PTSD?

Our results show that in Italy *network events*, followed by *accidents* and *unexpected death of a loved one* accounted for more than 75% of all reported TEs. These data are in line with the main traumatic events found in the European sample (Darves-Bornoz et al., 2008). Similar prevalence rates have emerged in our national sample data and in the whole European study with regard to network events and accidents, while lower prevalence rates were reported in Italy for *war events* and *physical* and *sexual violence*. Although the frequency of exposure to *war events* was not high even in the whole European population (Darves-Bornoz et al., 2008), in Italy even lower rates emerged, probably due to the fact that no significant war events have affected the country since the Second World War, and exposed subjects to this event may be too old or mostly deceased (Favaro et al., 2006; Sabes-Figuera et al., 2012).

Interestingly, in our sample the prevalence estimates of *physical* and *sexual violence* were almost as half as those detected in the whole ESEMeD study sample: these data should be interpreted with caution, and might represent a possible underestimate of such events in the Italian population. The occurrence of violence, particularly in the case of intimate partner violence and sexual abuse, are to be counted based on subjective recall of victims, and it is well known that both denial and minimization can occur (Faravelli et al., 2004a).

The exposure to physical and sexual violence has received increased attention over the past few decades worldwide, due to their high prevalence rate and deleterious effects on victims and society (Hien and Ruglass, 2009). In Italy, particular attention has been devoted to this issue, leading in the past ten years to a change in the legislation aimed at better protecting victims (De Fazio, 2011). Nevertheless, despite several studies show that women experience physical and sexual violence in an alarmingly higher rate than men, and suffer significantly more negative consequences, in Italy the majority of women suffering from abusive relationships seems to experience significant difficulties with seeking help (ISTAT: http://www.istat.it/it/archivio/file-standard). Specific surveys focusing on this topic of great societal concern, are urgently needed.

Our data also show low rates in the area of private events, lower than those reported in Europe, highlighting a possible denial of such events, which might have occurred but were not reported by respondents.

4.3. The risk of PTSD in the Italian sample

Looking at the conditional risk for PTSD, the highest percentage (12.2%) is associated with *war events*. In this class having seen atrocities represents the specific TE with far the highest associated value of conditional PTSD risk (100%), despite a prevalence of exposure as low as 0.5%. A high conditional PTSD risk is also associated by being beaten up by partner (30.6%), which represents the second high risk factor, followed by private events (13.5%), and having a child with serious illness (12.5%). These data are in line

Table 3
Conditional risk of dsm-iv/cidi ptsd by te type, mean duration and relative ptsd burden associated with tes in the italian sample ($n = 1,779$).

Event type	Conditional PTSD risk[a]	SE	No. of lifetime to date PTSD episodes[b]	SE	Mean PTSD duration (Months)[c]	SE	% Relative PTSD burden[d]	SE
War Events	12.2	4.86	1.2	0.51	530.1	74.70	20.6	9.31
• Combat experience	0.0	0.0	–	–	–	–	–	–
• Relief worker in war zone	0.0	0.0	–	–	–	–	–	–
• Civilian in war zone	3.0	2.56	0.1	0.11	18.0/	6.28	2.5	1.56
• Civilian in region of terror	0.0	0.0	–	–	–	–	–	–
• Refugee	0.0	0.0	–	–	–	–	–	–
• Saw atrocities	100	0.00	1.0	0.52	600.0	0.00	18.2	9.71
Physical Violence	2.7	1.39	0.4	0.20	14.0	12.74	6.9	3.25
• Kidnapped	1.8	1.96	0.0	0.02	24.0	0.00	0.4	0.45
• Beaten up by caregiver	0.4	0.46	0.0	0.00	240.0	0.00	0.2	0.09
• Beaten up by partner	30.6	16.11	0.3	0.20	5.2	2.78	5.8	3.25
• Beaten up by someone else	0.8	0.80	0.0	0.01	12.0	0.00	0.4	0.18
• Mugged or threatened with a weapon	0.0	0.0	–	–	–	–	–	–
Sexual Violence	0.8	0.55	0.1	0.04	199.8	128.58	1.1	0.64
• Raped	2.6	2.6	0.0	0.03	347.8	80.38	0.6	0.46
• Sexually assaulted	1.2	1.18	0.0	0.03	4	0.00	0.5	0.49
• Stalked	0.0	0.0	–	–	–	–	–	–
Accidents	1.5	1.08	0.7	0.53	35.9	18.58	13.0	7.08
• Toxic chemical exposure	0.0	0.00	–	–	–	–	–	–
• Automobile accident	0.0	0.00	–	–	–	–	–	–
• Other life threatening accident	0.0	0.00	–	–	–	–	–	–
• Natural disaster	1.9	1.86	0.2	0.21	2.0	0.00	3.7	3.46
• Man-made disaster	0.0	0.00	–	–	–	–	–	–
• Life-threatening illness	5.3	4.82	0.5	0.48	49.4	27.82	0.3	6.56
Unexpected death of loved one	4.6	1.47	1.4	0.46	21.8	7.48	24.1	5.78
Network events	1.1	0.70	1.2	0.75	14.3	14.77	21.7	11.84
• Child with serious illness	12.5	9.13	0.8	0.65	11.1	8.87	14.0	11.42
• Traumatic event to loved one	0.0	0.00	–	–	–	–	–	–
• Witnessed death/dead body, or saw someone seriously hurt	0.4	0.36	0.4	0.36	20.0	9.77	7.7	6.45
• Accidentally caused serious injury or death	0.0	0.00	–	–	–	–	–	–
Others	10.1	4.01	0.7	0.29	14.9	6.49	12.6	5.30
• Some other event	3.0	1.95	0.1	0.05	4.7	2.61	1.3	0.94
• Private event	13.5	5.87	0.6	0.28	16	7.33	11.3	5.13
Total with any event	2.5	1.24	5.7	2.94	127.3	114.66	100.0	0.00

[a] Conditional risk for PTSD varies significantly across broad TE classes ($\chi_6 = 23$ $p < 049$) and even more across specific TEs ($\chi_{17} = 24$, $p < 006$).

[b] Number of lifetime-to-date episodes of PTSD associated with this class of TEs and individual TE per 100 respondents.

[c] Mean duration of PTSD episode (or residual symptoms, in months) for episodes associated with TE in this class ($\chi_6 = 29,8$, $p < 001$) and individual TE types ($\chi_{11} = 711$, $p < 001$).

[d] Percentage of all PTSD cases that are associated with this specific TE or TEs class.

with WMH pooled European data reported by Darves-Bornoz et al. (2008), who found six events to be the most significantly associated with PTSD among individuals exposed to at least one event ($p < .001$): being raped, being beaten up by spouse or romantic partner, experiencing an undisclosed private event, having a child with serious illness, being beaten up by a caregiver or being stalked. In line with the current literature on risk factors for PTSD chronicity, we found that the duration of PTSD related to *war events* and *sexual violence* was higher than average, while that related to *physical violence*, *network events* and *others* had a lower than average duration (Davis and Breslau, 1994; Javidi and Yadollahie, 2012; Nemeroff et al., 2006).

Combining three factors (e.g., the prevalence of the event, the conditional risk of PTSD and the PTSD duration) we were able to estimate the relative burden of PTSD; it was highest when associated with the *unexpected death of a loved one* and having seen atrocities. The reasons why these events impose a high burden might be different: in the former case, in fact, this high toll can be due to the event high frequency in the general population rather than to the probability and duration of associated PTSD, which are indeed relatively low. The TEs class which accounted for the largest burden of PTSD, besides the *unexpected death of a loved one*, was *network events*, which also represented the TEs class with the highest prevalence rate. Conversely, having seen atrocities is not very common, but is associated to a high probability and duration

of PTSD, perhaps because of the very traumatic nature of these situations. These results may be taken into account for their important implications in everyday practice, in particular to detect subjects at higher risk for PTSD, such as bereaved parents that may deserve special attention, either in clinical settings where their children may have died after facing severe illnesses, or in the general population where the death may have occurred because of other violent, unexpected causes. Increased suicidality has in fact been reported in bereaved parents and, considering the high risk for suicide in PTSD subjects, a special attention should be paid to such cases (Davies, 2006; Murphy et al., 2003a, 2003b; Nakajima et al., 2012).

Finally, we found a significant association between some sociodemographic variables and TEs, lifetime or 12-month PTSD prevalence estimates in the Italian population; these data are in line with many epidemiologic studies conducted in civilian populations, which consistently show men to be at increased risk of trauma exposure, while women experience an increased risk of lifetime PTSD (Breslau et al., 1998; Dell'Osso et al., 2011; Friedman et al., 2011; Karam et al., 2014; Nakajima et al., 2012). Interestingly, in this study individuals older than 60 years, never married, and with high average education reported to be at higher risk to TEs exposure; while in the ESEMeD study Darves-Bornoz et al. (2008) reported a similar trend for the role of education, they found opposite results with regard to civil status, with previously married subjects

Table 4
Associations of socio-demographic factors with lifetime and 12-month PTSD in the italian sample ($n = 1,779$).

Variable	Lifetime trauma exposure	Lifetime PTSD OR (OR range)			12-Month PTSD OR (OR range)			
		Among total sample	Among those with events	Among those with events, controlling for events	Among total sample	Among those with events	Among those with events, controlling for events	Among PTSD lifetime
Gender								
Male	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Female	0.73 (0.56–0.84)[a]	4.07 (1.78–9.32)[a]	5,26 (1.82–15.16)[a]	5.37 (1.64–17.62)[a]	2.16 (0.58–4.14)	3.25 (0.53–19.98)	4.14 (0.64–26,92)	0.12 (0.01–1.53)
Age								
18–34	0.42 (0.23–0.78)[a]	0.16 (0.02–1.30)	1.49 (0.09–24.91)	1.28 (0.05–30.10)	0.14 (0.01–2.19)	4.71 (0.22–100.79)	2.85 (0.15–53.14)	0.09 (0.00–2.87)
35–44	0.41 (0.23–0.73)[a]	0.38 (0.05–3.14)	2.33 (0.13–43.12)	2.81 (0.09–83.83)	0.48 (0.09–2.55)	3.90 (0.48–31.32)	3.37 (0.48–23.64)	3.29 (0.11–98.99)
45–59	0.91 (0.55–1.52)	0.80 (0.13–4.84)	1.79 (0.19–16.64)	2.11 (0.14–31.03)	0.63 (0.17–2.32)	1.99 (0.22–18.15)	1.97 (0.26–15.20)	0.26 (0.02–3.98)
60+	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Marital Status								
Married	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Previously married	1.26 (0.83–1.82)	0.58 (0.25–6.35)	0.66 (0.14–3.07)	0.52 (0.09–2.96)	0.39 (0.08–2.00)	0.12 (0.02–0.80)[a]	0.08 (0.01–0.54)[a]	0.01 (0.00–0.31)[a]
Never married	1.43 (1.02–1.95)[a]	0.53 (0.17–1.64)	0.32 (0.08–1.26)	0.27 (0.07–1.06)	0.45 (0.04–4.45)	0.13 (0.01–1.74)	0.13 (0.01–1.72)	2.99 (0.10–92.58)
Education Level								
Low	0.46 (0.27–0.79)[a]	1.21 (0.50–2.92)	5.33 (1.61–17.62)[a]	5.04 (1.40–18.13)[a]	0.80 (0.19–3.91)	8.68 (1.30–58.18)[a]	7.61 (1.18–48.93)[a]	17.12 (1.15–254.69)[a]
Low-average	0.58 (0.38–0.94)[a]	2.66 (0.91–7.77)	3.62 (0.89–14.81)	3.48 (0.70–17.34)	2.29 (0.01–8.60)	3.10 (0.60–16.08)	2.66 (0.53–13.27)	7.25 (0.42–125.09)
High-average	1.05 (0.73–1.49)	2.79 (0.95–8,22)	2.84 (0.81–9.93)	2.45 (0.74–8.07)	–	–	–	–
High	1.00	1.00	1.00	1.00	–	–	–	–
High-average or high					1.00	1.00	1.00	1.00
Employment								
Employed	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Homemaker	0.80 (0.56–1.16)	0.42 (0.15–1.17)	1.03 (0.28–3.75)	1.11 (0.28–4.47)	0.67 (0.24–1.9)	2.84 (0.64–12.54)	2.93 (0.60–14.32)	16.10 (1.68–153.80)[a]
Retired	1.27 (0.79–2.03)	1.37 (0.19–9.90)	3.26 (0.48–24.18)	3.57 (0.26–48.61)	0.76 (0.28–2.08)	3.34 (0.63–17.80)	3.40 (0.67–17.33)	0.29 (0.02–3.76)
Other	0.72 (0.47–1.09)	2.49 (1.04–5,92)[a]	1.95 (0.81–4.71)	2.15 (1.00–4.63)	1.83 (0.35–9.50)	1.62 (0.36–7.27)	1.50 (0.30–7.46)	0.37 (0.01–21.10)

[a] Statistically significant ($p < .05$); OR = Odds Ratio.

showing the highest risk of trauma exposure. A possible interpretation of the higher risk of TEs exposure among individuals older than 60 in our sample may consider the fact that these subject could have experienced relevant war events leading to the highest conditional PTSD risk.

4.4. Limitations

This study has several limitations that deserve attention. First, like all epidemiological studies on PTSD and trauma exposure in the general population, we relied on participants' retrospective recall of trauma, symptoms and, consequently, on their temporal and causal relationship. As highlighted in most epidemiological studies on PTSD, respondents may be more likely to report TEs that caused significant distress, potentially under-reporting other TEs. Conversely, severe trauma may be under-reported or neglected such as sexual violence or abuse experiences. Nevertheless, as already discussed, some stigmatized events (such as sexual or private violence) may have been denied or underreported; the use of a detailed trauma checklist may have reduced such problem. Similarly, retrospective recall of mental disorders may have biased the true prevalence of these disorders (Hardt and Rutter, 2004; Moffitt et al., 2010).

5. Conclusions

Despite the limitations mentioned above this report has four important strengths. First, we present the burden of PTSD in relation to the full range of TEs assessed in the ESEMeD. Second, we used the random event method to enable inferences to be drawn about PTSD risk associated with the full set of TEs occurring in the population. The more common practice of using the worst event as the index trauma for PTSD overestimates the conditional risk of PTSD, because worst traumas are atypical and presumably have a higher risk of PTSD compared with more typical traumas (Breslau et al., 1998; Kessler et al., 1995; Norris et al., 2003). Third, we examine events in relation not only to onset but also chronicity of PTSD enabling us to determine which events account for the burden of PTSD in the population. Fourth, we examine separate socio-demographic correlates of TE exposure, PTSD onset among people exposed to TEs, and chronicity of cases of PTSD. This approach allowed us to provide a more accurate account than in previous studies of the relative importance of different traumas in accounting for PTSD public health burden in Italy.

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