Trauma and Guilt: Correlation between type of Trauma and Age with Trauma-related Guilt.

Abstract
People who are exposed to traumatic events in their life often experience trauma-related guilt.
Objectives: The present study has four main aims. The first aim is to understand to which types of traumas is the clinical population mainly exposed. The second one is to understand which types of traumas have a higher correlation with the development of trauma-related guilt. The third aim of this study is to understand at which age being exposed to one or more traumatic event is more likely to be correlated to the development of trauma-related guilt. Finally, the last aim of the study is to understand if there is a correlation between higher levels of guilt proneness and the severity of the PTSD symptoms experienced by the subjects.
Sample: the sample of this study is made up by 80 people (F=45, M=35, average age=26) that are being treated in two mental health centers, independently from their diagnosis, with an age in between 18 and 35 years old.
Method: Subjects were administered three psychological instruments. The International Trauma Exposure Measure (ITEM), the Personality Feeling Questionnaire-2 (PFQ-2) and the International Trauma Questionnaire (ITQ). The two statistical softwares Excel and Jamovi were used to analyze the data.
Results: It was found that the most common traumatic events experienced by the clinical population are: "being repeatedly insulted, humiliated or put down by another person", "being repeatedly made to feel unloved, unwelcome or worthless", "being repeatedly neglected, ignored, rejected or isolated", "being repeatedly bullied" , "diagnosis with a life-threatening illness of someone close to you or his/her involvement in a potentially lethal accident" and "awful death of someone close to you". Furthermore, from the results of this study it appears that there are not some typologies of traumas with a stronger relationship to the development of trauma-related guilt than others and that there is not a life stage (infancy, adolescence, adulthood) during which being exposed to a traumatic event seems to be more correlated to the development of trauma-related guilt. Finally, this study results show that guilt proneness is a significant predictor of PTSD symptoms severity, with higher levels of guilt proneness associated with higher levels of PTSD.

1.Introduction

1.1 Literature

People who are exposed to traumatic events in their life often experience trauma-related guilt.
According to the American Psychological Association (2013) trauma is defined as an emotional response to a terrible event like an accident, rape or a natural disaster. The psychiatric classifications and the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) define a traumatic event as the exposure to: death, threatened death, actual or threatened serious injuries, or actual and threatened sexual violence (APA, 2013). These events are often characterized by an extreme sense of powerlessness and by a disruption of beliefs and expectations (Kleber, 2019).
A clinically significant number of people who experience such an event may go on to develop Acute Stress Disorder (symptomatology occurs in the first months after the trauma) or Post Traumatic Stress Disorder (symptoms occur for at least one month following trauma) (James et al., 2016).

Considering the prevalence of traumatic experiences in the general population in the literature there are many previous studies that talk about the epidemiology of trauma. One of these studies states that in the general population over 70% of people reported exposure to a traumatic event and 30.5% were exposed to four or more (Benjet et al., 2016). Furthermore this study highlights that five types of trauma, witnessing death or serious injury, the unexpected death of a loved one, being mugged, being in a life-threatening automobile accident and experiencing a life-threatening illness or injury, account for over half of all the exposures (Benjet et al., 2016). However, to my knowledge, in the literature there are not many studies that talk about which are the most common types of traumas in the clinical population.

Changes to the DSM-V diagnostic criteria for PTSD highlight that exposure to traumatic events can lead to the development of trauma-related guilt and shame (Stotz et al., 2015).

Guilt can be defined as an emotional construct resulting from perceived moral transgression which may be related to social norms and linked to specific behaviors (Kip et al., 2022). As guilt feelings are associated with a particular event-related behaviour ('I did bad'), and remain external and apart from the whole self-experience, they provoke a sense of tension, remorse, and intrusive preoccupation. Accordingly, we suggest that guilt-driven processes correspond to intrusive and hyperarousal PTSD symptom clusters (e.g. startle response), as well as to externalized emotion dysregulation that can express itself as anger and irritability (Fine, 2023).

Although guilt is often associated to psychological maladjustment some research suggest that it may be an adaptive emotion. Guilt is associated to factors like empathy that relate to maintaining strong interpersonal bonds, moreover guilt-prone people are less likely to engage in destructive, impulsive or criminal activities (Brandy et al., 2005).

It is also widely assumed that guilt leads people to engage into reparatory behaviors. Guilt, in fact, increases attention toward positive and reparation-oriented cues and it makes attitudes toward reparation-oriented primes more positive (Graton et al., 2017).

Guilt can be both dispositional and chronic or situation specific and transient, such as trauma-related guilt (Kip et al., 2022).

Dispositional and chronic guilt is a stable individuals' tendency to experience guilt related feelings and it depends on individuals' personality. Situation specific and transient guilt, instead, is the tendency to experience guilt following a specific event and it's not permanent.

Guilt following trauma is common and previous studies have found that 83% of trauma exposed individuals with probable PTSD report experiencing trauma-related guilt in their lifetime and 34% report experiencing trauma related guilt in the past month (Miller et al., 2013).

Kubany and colleagues (2003) created a comprehensive model of trauma-related guilt.

The authors conceptualized trauma-related guilt as a multidimensional construct including affective and cognitive dimensions. According to them guilt consists of an emotional component and a set of interrelated beliefs about one's role in a negative event and starting from this idea they defined guilt as "an unpleasant feeling with accompanying beliefs that one should have thought, felt or acted differently". Kubany and colleagues (2003) developed a theory that states that the magnitude of guilt a person will experience after a negative event is based on the presence and on the magnitude of five factors. The first factor is related to the affective dimension, and it includes distress about a negative event. The other 4 factors are related to the cognitive dimension, and they are: 1) Perceived responsibility for the occurrence of the negative event. 2) Perceived insufficient justification for the action taken 3) Perceived violation of values 4) Perceived predictability of the negative outcome (Kubany et al., 2003).

Growing evidence indicates that trauma-related guilt typically concerning negative appraisals of one's action or inaction during a traumatic event, is associated with PTSD, depression, suicidality and, possibly, substance use (Capone et al., 2020).

It appears from the results of the 2016 World Mental Health Survey Consortium that the most commonly reported individual traumatic event is the sudden loss of a loved one, especially if

the death was violent and unexpected, witnessing death or serious bodily harm to someone else is the second most commonly experienced traumatic event, while the third and fourth most commonly experienced traumatic events are muggings and severe motor vehicle collisions (Feriante et al., 2023). The results obtained report the epidemiology of traumatic experiences in the general population, however to my knowledge literature lacks studies reporting the epidemiology of traumatic experiences in the clinical population.

Starting from the assumption that a strong correlation between trauma and guilt exists there are few studies that tried to understand if there are specific traumatic events that have a higher correlation with trauma-related guilt than others and their results show that interpersonal traumatic events, including violence, may have stronger associations with adverse outcomes than non-interpersonal events (Aakvaag et al., 2016). Besides, previous studies found that violent events may differ in ways that are pertinent to shame and guilt, including wether the event is stigmatized, as sexual abuse may be, wether the event is experienced early in life, and wether it occurs in close relationships (Aakvaag et al., 2016).

Furthermore, when dealing with trauma the relationship between age of exposure and the development of trauma-related guilt is a key element. Previous studies found that childhood sexual assault, physical abuse, and neglect were stronger predictors of PTSD onset than adolescent and early adult occurrence of these events (McCutcheon et al., 2010). Moreover, it was found that guilt is an important associated feature of PTSD (Pugh et al.,2015) and that exposure to trauma during childhood is more likely to lead to the development of PTSD than exposure to trauma when individuals are older (Ogle et al., 2013).

Another study found that the adolescence period is strongly associated with dispositional shame and guilt due to maturational changes in emotional regulation that take place in this developmental period (Szentágotai-Tătar et al., 2016).

Both the correlation between type of trauma and trauma-related guilt and the correlation between age of exposure and trauma-related guilt are topics that need to be further investigated.

Psychologists have long speculated about the links between shame and guilt and various forms of psychopathology. Using the Personal Feelings Questionnaire, Harder and Lewis (1987) found that both shame- and guilt-proneness were associated with depression, anxiety, hostility, and low self-esteem. However following studies found that shame-proneness is more strongly related to psychopathology symptoms than is guilt-proneness. Further investigations found that relations between guilt-proneness and psychopathology symptoms are attributable to shared variance between shame- and guilt-proneness (Tangney et al., 1992). Talking about the relationship between guilt-proneness and the severity of PTSD symptoms it was found by previous research that higher levels of guilt and shame are associated with more severe PTSD symptoms in survivors of various traumatic events, including domestic violence, child sexual abuse, and adult sexual assault (Street et al., 2005). Furthermore, trauma-related guilt was related to increased PTSD symptomatology both directly and indirectly in a study of women experiencing both physical and psychological abuse from their romantic partners (Beck et al., 2011). However, another study showed that shame and guilt proneness had significant cross-sectional correlations with PTSD severity, but did not show associations when controlled depression severity (Shin et al., 2014). Even if the relationship between guilt-proneness and severity of PTSD symptoms has been widely investigated in literature there is still uncertainty about the results, and this is why it needs to be further investigated.

1.2 Research aims

The following study has three main aims:

1. The first aim is to understand to which types of traumas is the clinical population mainly exposed.

2. The second aim is to understand which types of traumas have a higher correlation with the development of trauma-related guilt.
3. The third aim of this study is to understand at which age being exposed to one or more traumatic event is more likely to be correlated to the development of trauma-related guilt.
4. The fourth aim is to understand if there is a correlation between higher levels of guilt proneness and the severity of the PTSD symptoms experienced by the subjects.

1.3 Hypotheses

Our hypotheses related to the three research questions addressed in this study are based on what is reported in the introduction and they are the following:

1. The most common types of traumas in the clinical population could be the horrible death of a loved one, witnessing death or serious bodily harm to someone else, being involved in a robbery and being involved in a severe and potentially lethal accident.
2. Being assaulted (by a parent or by someone else) and being sexually abused (by a parent or by someone else) have a higher correlation to trauma-related guilt compared to all the other types of traumas considered in the study due to the fact that these events are stigmatized. This means that we hypothesize that traumas involving physical threats have a higher correlation to trauma-related guilt.
3. Exposure to trauma during childhood (0-13) and during the adolescence period (14-19) is more likely to lead to the development of trauma-related guilt compared to exposure to trauma in people who are older than 19.
4. Subjects with a higher level of guilt proneness experience PTSD symptoms that are more severe compared to subjects with lower levels of guilt proneness.

The data used for this study are part of the data collected for a bigger observational study. This study starts from the assumption that mental health users have more often been exposed to traumatic life events compared to the general population (Floen et al., 2007). Since experiencing traumatic events is a particularly negative prognostic index in the psychiatric population and since there is a lot of uncertainty about the prevalence of Post Traumatic Stress Disorder in the psychiatric population, this study aims to obtain a clear overview of the exposure to traumatic events in mental health users compared to the the general population.

2. Methods

The data used to conduct this cross sectional descriptive and correlational study are part of a bigger data set collected for an observational study. All the data were collected online using the platform Qualtrics.

2.1 Sample

This study was conducted on a sample of 80 people (F=45, M=35, average age=26) that are being treated in two mental health centers, independently from their diagnosis, with an age in between 18 and 35 years old. The two mental health centers are in Garbagnate and in Verona. In order to have a sample made up by 80 mental health users, for a three month period, all the patients that were treated in the two involved mental health centers were invited to participate to the study. The exclusion criteria were mild or severe mental retardation and absence of fluency in Italian. All the participants signed an informed consent before filling in the

questionnaires and, after doing so, they were asked to sign an optional consent to be contacted again for following evaluations.

2.2 Instruments

For the purpose of this study participants were asked to complete three psychological instruments.

The first psychological instrument is the International Trauma Exposure Measure (ITEM) and it is a 21 ITEM checklist capturing traumatic life events, and their associated features, in a manner consistent with the definition of trauma exposure in the 11th version of the International Classification of Diseases (Rossi et al., 2022). The ITEM measures exposure to 21 different traumatic life events across different developmental periods: childhood, adolescence, and adulthood (cfr https://www.traumameasuresglobal.com).

The Italian version of the International Trauma Exposure Measure includes a total of 26 items because the last 4 items are questions related to the traumatic experiences that respondents consider to be the most stressful they have ever experienced. For the purpose of this study the 21 traumatic experiences considered in the ITEM were divided in three main categories: "Physical threats" "Psychological threats" and "Indirect trauma". Physical threats category comprehends all the tramautic experiences involving physical threats to the indivual who is directly experiencing the trauma. The second category "Psychological threats" comprehends all the traumatic experiences involving psychological threats for the individual directly experiencing the trauma. The third category "indirect trauma" comprehends all the traumatic experiences in which the subject who actually lived the traumatic event is not the one considered in the study, but the traumatic experiences affect also the analyzed individual. Participants were also administered the PFQ-2. The PFQ-2 is a 22-item measure assessing shame-proneness and guilt-proneness, comprising 10 items assessing 'shame-proneness', 6 items assessing'guilt-proneness' and 6 filler items (Hoppen et al., 2022). The PFQ-2 is a self-report, adjective-based scale in which subjects answer by indicating a number from 0 to 4 for all the 22 presented adjectives where 0 means "I don't experience the feeling" and 4 means "I experience the feeling very strongly" (Da Silva et al., 2022). The PFQ-2 has a two factor structure and in a study assessing the psychometric properties of this instrument in an Italian sample the two scales showed acceptable to good internal consistency (shame: $\alpha = .82$, guilt: $\alpha = .71$) (Di Sarno et al., 2019).

The last instrument participants were administered is the International Trauma Questionnaire (ITQ), a brief, simply worded measure, focusing only on the core features of Post-Traumatic Stress Disorder (PTSD) and complex Post-Traumatic stress disorder (CPTSD). This instrument was developed to be consistent with the organizing principles of the International Classification of Diseases (ICD-11), as set forth by the World Health Organization, which are to maximize clinical utility and ensure international applicability through a focus on the core symptoms of a given disorder (cfr https://www.traumameasuresglobal.com). The ITQ includes six items measuring each PTSD symptom from the three clusters of 'Re-experiencing in the here and now', 'Avoidance', and 'Sense of Threat', and these items are answered in terms of how bothersome that symptom has been in the past month. The ITQ also includes six items measuring each 'Disturbance in Self-Organization' (DSO) symptom from the three clusters of 'Affective Dysregulation', 'Negative Self- Concept', and 'Disturbed Relationships'. These items are answered in terms of how a respondent typically feels, thinks about oneself, and relates to others. The PTSD and DSO symptoms are accompanied by three items measuring associated functional impairments in the domains of social, occupation, and other impor-tant

areas of life. All ITQ items are answered on a 5-point Likert scale ranging from 0 (Not at all) to 4 (Extremely). Thus, PTSD and DSO symptom scores range from 0 to 24 (i.e. the sum of the six items from each sub-scale), and CPTSD symptom scores range from 0 to 48 (i.e. the sum of the 12 ITQ items).
For diagnostic purposes, each symptom and functional impairment indicator was considered 'present' based on a score of ≥ 2 (Moderately) on the Likert scale (Cloitre et al., 2018). The requirements for probable PTSD diagnosis are met if a person is trauma exposed, at least one symptom is present from each PTSD cluster, and there is functional impairment associated with these symptoms. The diagnostic requirements for CPTSD are met if the PTSD criteria are satisfied, and at least one symptom is present from each DSO cluster, and there is functional impairment associated with these symptoms. As per the ICD-11 diagnostic rules, a person can may receive a diagnosis of PTSD or CPTSD, but not both. Thus, if a person meets the criteria for CPTSD they do not also receive a diagnosis of PTSD (Cloitre et al., 2021). The ITQ has strong internal consistency reliability as indicated by Cronbach's alpha and MacDonald's omega ($\alpha = 0.87$; $\omega = 0.88$) (Camden et al., 2023).

2.3 Data analysis

The statistical softwares Excel and Jamovi were used to analyze the data.
In order to answer to the first research question the frequencies of each of the 21 traumatic experiences presented in the ITEM instrument for all of the 80 participants were calculated.
In order to answer to the second research question I started by calculating the level of guilt proneness shown by the participants obtaining the summed score (from 0 to 24) of the six items in the PFQ-2 measuring guilt proneness.
While analyzing the data to answer to the 2nd research question, each of the traumas that were reported as the most stressful were assigned to one of the three categories "physical threats", "psychological threats" or "indirect trauma" (Table S1-S3). Subsequently a one-way ANOVA to assess differences between the three groups was calculated. Finally, post-hoc analysis to understand specifically which group differed from each other were conducted.
To answer to the third research question a one-way ANOVA was conducted considering the three age categories (less than 14, 14-19, older than 19), based on how old the patients were when they had lived the trauma they indicated as the most stressful they have experienced.
To answer to the third research question the dimensional scoring of the ITQ for the subscale Post-Traumatic stress disorder was performed, obtaining a summed score from 0 to 24 by summing the answers given by the subjects in the items 1 to 6. Subsequently a regression analysis was performed in order to understand if there is a correlation between higher scores in the PTSD subscale of the ITQ and higher level of guilt-proneness.

3.Results

A total of 80 subjects participated to the study and their sociodemographic characteristics are described in table 1. Two health centers were used to draw up participants, a mental health center in Garbagnate (40 subjects, 50%) and a mental health center in Verona (40 subjects, 50%).

Table 1. Descriptive characteristics of the sample

	ID	Age	Gender	Years of education	Guilt proneness
N	80	80	80	72	80
Missing	0	0	0	8	0
Mean		26.0	0.438	12.8	11.7
Median		25.0	0.00	13.0	11.0
Standard deviation		4.92	0.499	2.68	5.88
Minimum		18	0	8	1
Maximum		36	1	18	24

Analyzing the answers given by the subjects in the ITEM instrument we obtained the frequency of the different traumatic events in the clinical population (Fig.1). Being repeatedly insulted, humiliated or put down by another person is the traumatic experience with the highest frequency in the clinical population (Item 19, 49/80 subjects). This traumatic experience is followed by "being repeatedly made to feel unloved, unwelcome or worthless" (Item 20, 46/80 subjects), "being repeatedly neglected, ignored, rejected or isolated" (Item 21, 45/80 subjects), and "being repeatedly bullied" (Item 18, 42/80 subjects). All of these traumatic experiences are part of the category "psychological threats". For this reason, we can assume that psychological threats are the most common traumatic experiences lived by the clinical population. Furthermore, other two traumatic experiences with a very high frequency are "diagnosis with a life-threatening illness of someone close to you or his/her involvement in a potentially lethal accident" (Item 3, 44/80 subjects) and "awful death of someone close to you" (Item 2, 33/80 subjects). Instead, the traumatic experiences with a lower prevalence are "being sexually assaulted by a parent or a guardian" (Item 7, 1/80 subjects), "being exposed to wars or combats" (Item 10, 1/80 subjects) and "being exposed to a human made disaster" (Item 16, 1/80 subjects). Fig. 2 shows the frequency with which the traumatic experiences indicated by the subjects as the most stressful they have experienced belong to the three categories "physical threats", "psychological threats" and "indirect trauma".

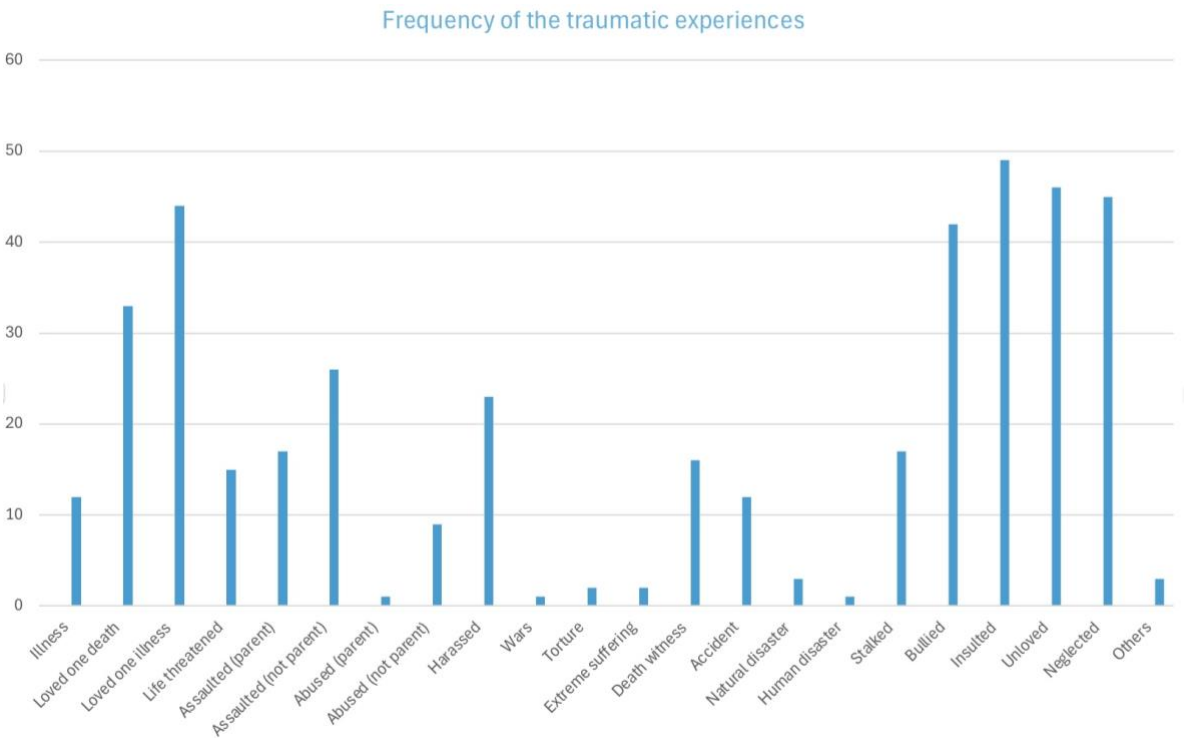

Fig.1 Frequency of the traumatic experiences

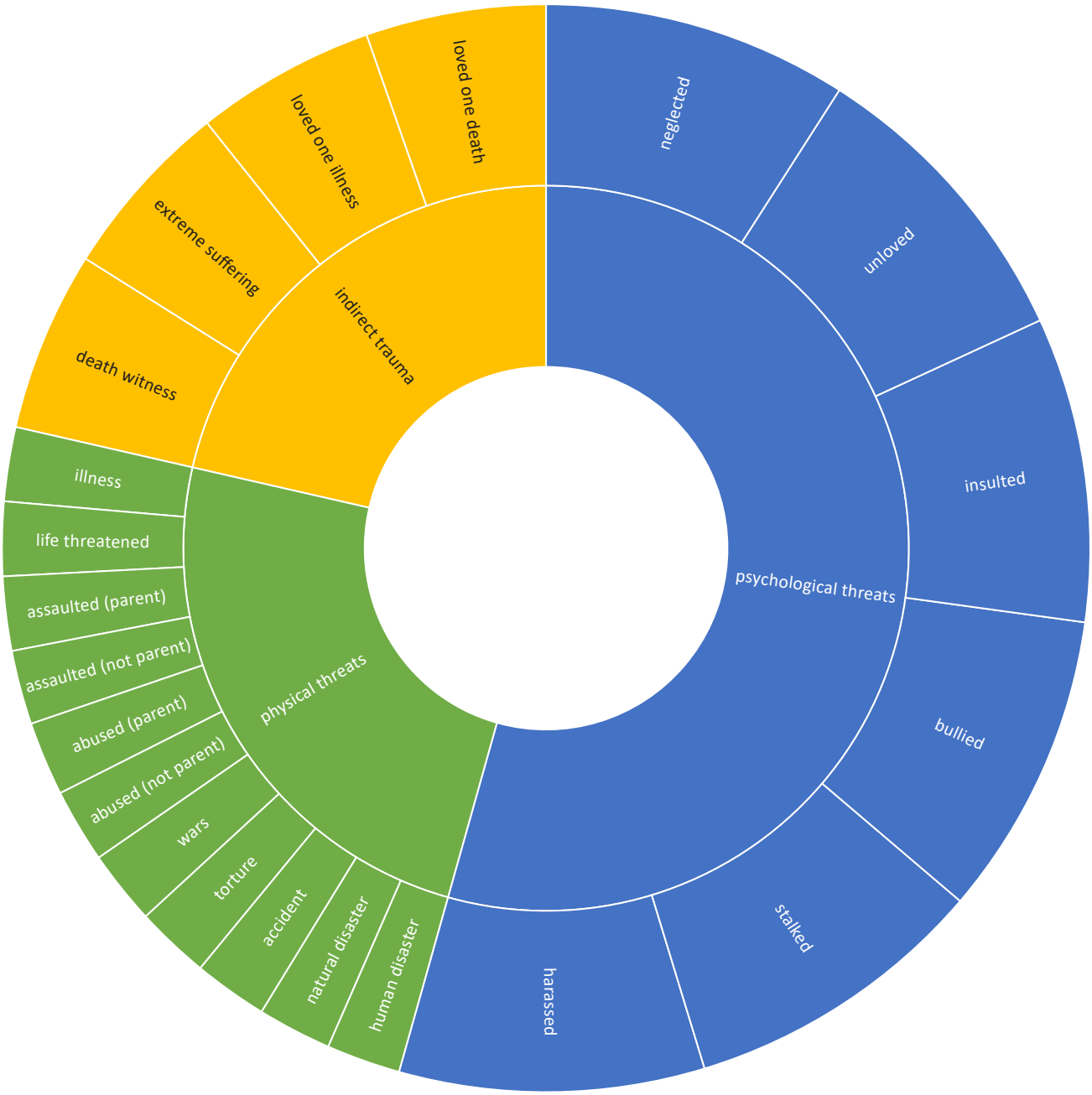

Fig 2. Frequency of the categories of traumatic experiences

Conducting the analyses to answer to the 2nd and the 3rd research questions only the trauma that each subject indicated as the most stressful they have experienced in their life was considered and fig. 3 reports the average guilt level associated with each of the traumatic experiences that at least one subject indicated as the most stressful they have experienced in their life.

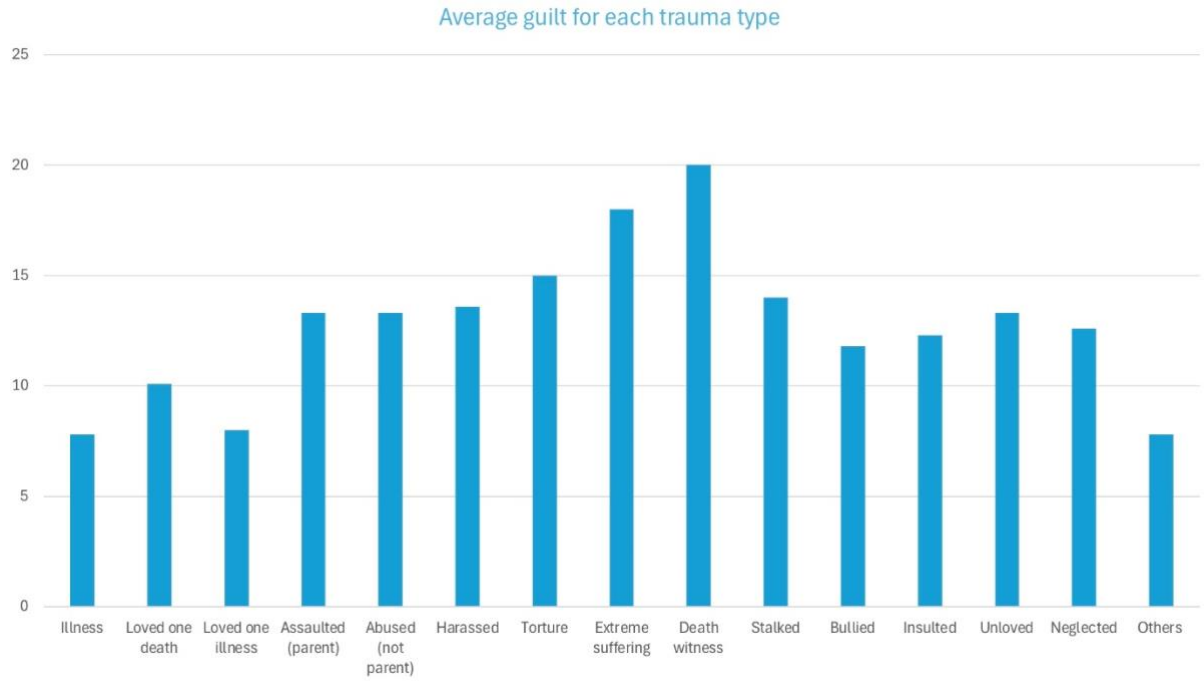

Fig 3. Average guilt for each trauma type

To answer to the second research question, which is about the correlation between different types of traumatic experiences and trauma-related guilt, a one-way ANOVA was conducted exploring eventual differences between the means of the three categories in terms of the guilt-proneness showed by the participants. 70 out of 80 subjects that participated to the study gave a valid answer to this question, the other ten answers were either invalid or absent. Mean of guilt proneness considering the three participants most stressful events categories are reported in Table 2. The group descriptives obtained are described in Table 2 and in figure 4. Guilt proneness mean values for the participants that selected as the most stressful trauma they have ever lived an event belonging to the category "physical threats" is 12, for those who selected a trauma belonging to the category "psychological threats" is 12.3, and for those who chose a trauma belonging to the category "indirect trauma" is 10.9. Performing the Anova it was found, using the Shapiro-Wilk test, that guilt data are normally distributed ($p = 0{,}189$) and this is why a parametric Anova was used. Anova results were not significant ($F_{(2,29)} = 0.266$, $p = 0.768$). Furthermore, analyzing Fig. 4 we notice that the confidence of interval of the category "psychological threats" is smaller compared to other two categories.

Table 2. Guilt proneness descriptives X the trauma categories

	Type of trauma	N	Mean	SD	SE
Guilt proneness	Physical threat	17	12.0	6.25	1.517
	Psychological threat	38	12.3	5.76	0.934
	Indirect trauma	15	10.9	6.70	1.729

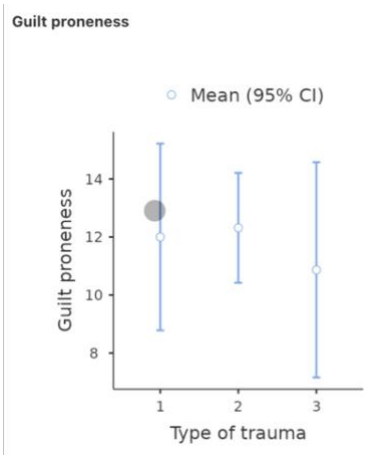

Figure 4. Guilt proneness confidence of interval X trauma categories

In order to answer to the third research question, which is about the impact that age of exposure to a traumatic event can have in terms of developing trauma-related guilt, we performed a one-way ANOVA. We considered the three categories "< 14", "14-19" and "> 19", that represent the age of our subjects when they suffered the trauma they reported as the most stressful they have ever experienced. Our aim is to understand if there is a significant difference between the means of these three categories in terms of the guilt proneness felt by the subjects following the traumatic experience. 67 out of 80 subjects were considered when conducting the analysis, the other 13 subjects either didn't specify which is the most stressful trauma they have ever lived or didn't specify how old they were when they experienced this event. The group descriptives we obtained are reported in Table 3 and in figure 5. Analyzing these data we observe that the average guilt felt by subjects who experienced their most stressful trauma during infancy (< 14) is higher (12.3) compared to the average guilt felt by those who experienced the trauma during adolescence or during adulthood.

Table 3. Guilt proneness descriptives X age group

	Age groups	N	Mean	SD	SE
Guilt proneness	< 14	22	12.3	5.07	1.08
	14-19	20	11.8	6.31	1.41
	> 19	25	11.5	6.08	1.22

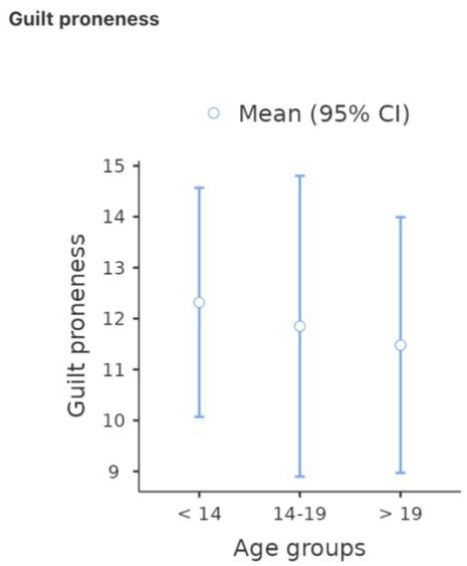

Figure 5. Guilt proneness confidence of interval x age groups

Performing the Anova it was found, using the Shapiro-Wilk test, that guilt data are normally distributed (p = 0,342) and this is why a parametric Anova was used. The results we obtained conducting the one-way ANOVA didn't show significant differences ($F_{(2,41)}$ =0,132, p = 0.877). This means that the difference between the means of the three categories doesn't have a statistical significance.

To answer to the the 4th research question, which is about the correlation between levels of guilt proneness and the severity of PTSD symptoms, a linear regression analysis was performed and the results are presented in table 4 and table 5. Table 4 shows that the correlation coefficient (R=0,626) indicates a moderate to strong positive relationship between guilt proneness and severity of PTSD symptoms. Table 5 shows that guilt proneness is a significant predictor of PTSD symptoms severity, with higher levels of guilt proneness associated with higher levels of PTSD. The statistical significance (p<.001) suggests a strong and reliable relationship between these variables.

Table 4. Model fit measures

Model	R	R^2
1	0.626	0.392

Table 5. Linear regression analysis

Predictor	Estimate	SE	t	p
Intercept	3.388	1.3047	2.60	0.011

Predictor	Estimate	SE	t	p
Guilt	0.689	0.0985	7.00	< .001

4. Discussion

This study aspired to investigate which are the most common traumatic experiences lived by the clinical population. Other two objectives were to understand which are the types of traumas with a higher correlation to trauma-related guilt and to discover at what age being exposed to a traumatic event seems to have a higher correlation with the development of guilt proneness. Finally, the last objective was to understand if higher levels of guilt proneness could be correlated to a more severe experience of PTSD symptoms.

This study shows that the most commonly experienced traumatic events by the clinical population are "being repeatedly insulted, humiliated or put down by another person", "being repeatedly made to feel unloved, unwelcome or worthless", "being repeatedly neglected, ignored, rejected or isolated", and "being repeatedly bullied". Other than these four traumatic experiences belonging to the category "psychological threats", other two traumatic events with a very high frequency are "diagnosis with a life-threatening illness of someone close to you or his/her involvement in a potentially lethal accident" and "awful death of someone close to you". This results fail to confirm our hypothesis which states that the most common types of traumas in the clinical population could be: the horrible death of a loved one, witnessing death or serious bodily harm to someone else, being involved in a robbery and being involved in a severe and potentially lethal accident (Feriante et al., 2023). Our hypothesis was based on the results of the 2016 World Mental Health Survey Consortium, that were obtained administering the Composite International Diagnostic Interview (CIDI) to a sample made up by individuals coming from the general population and living in 24 different countries, with 14 of them being high-income countries, 7 of them being upper-middle income countries and 6 of them being lower-middle income countries (Benjet et al., 2016). The main reason why our results don't confirm our hypothesis is the structural difference between the International Trauma Exposure Measure (ITEM) , which was used to obtain the results in our study, and the Composite International Diagnostic Interview (CIDI), which was used to obtain the results in the 2016 World Mental Health Consortium. In fact, the traumatic experiences that appear to be the most commonly experienced by the clinical population according to our study, belong to the category "psychological threats" and the Composite International Diagnostic Interview doesn't consider traumatic experiences belonging to this category. In fact, the CIDI is a fully standardized, structured interview that provides a psychiatric diagnosis through computerized algorithms in accordance with the International Classification of Diseases, 10th edition (ICD-10) and the American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) (Quintana et al., 2012). The PTSD section of the CIDI is composed of a list of 27 different traumatic experiences, all of them belonging to the two categories "physical threats" or "indirect trauma". This explanation about why our results are not confirming our hypothesis is corroborated by the fact that, following the 4 most common traumatic experiences belonging to the category "psychological threats", one of the the most common traumatic experiences according to our study is "awful death of someone close to you". This appears as the most common traumatic experience in our hypothesis too. Another explanation for the discrepancy between our results and our hypothesis could be the difference in the sample size and structure. Our sample is made up by 80 subjects belonging to the clinical population and

coming only from the north of Italy. The sample of the 2016 World Mental Health Consortium is made up by 125 718 adults coming from 24 different countries (Benjet et al., 2016).
The results of our study highlight that there is not a significant difference between the type of trauma indicated by each subject as the most stressful they have ever lived and the level of trauma-related guilt experienced. These results are inconsistent with our initial hypothesis. In fact, we hypothesized that being assaulted (by a parent or by someone else) and being sexually abused (by a parent or by someone else) should have a higher correlation to trauma-related guilt compared to all the other types of traumas considered in the study due to the fact that these events are stigmatized.
The main reason why our results don't confirm our hypothesis could be that, in order to perform the analysis, we grouped the different traumas belonging to the ITEM instrument in the three categories "physical threats", "psychological threats" and "indirect trauma". The three categories that were created contain some events that are stigmatized, just like "being assaulted" and "being sexually abused", which are part of the category "physical threats", but they also contain other traumatic experiences which are not stigmatized. According to the APA ,stigma can be described as a negative social attitude or taint associated with a particular person, group, or experience, which invokes feelings such as shame or guilt and can lead to unfair discrimination against the individual (American Psychological Association, n.d.). Considering the level of stigma associated to a traumatic event as the main factor that correlates a traumatic event to the development of trauma-related guilt (Aakvaag et al., 2016), could explain why no significant difference between the three categories has been found, since, each category contains some traumatic events with a strong stigma and some traumatic event which are not stigmatized. Further studies could consider each traumatic event individually in order to understand if significant differences, in terms of the guilt proneness experienced by each subject after the event, are present or not.
Furthermore this study shows that there is not significant difference between people who experienced their most stressful traumatic experience during infancy (<14), during adolescence (14-19) or during adulthood (>19), in terms of the development of trauma-related guilt. These results don't confirm our hypothesis which was that exposure to trauma during childhood (0-13) and during the adolescence period (14-19) is more likely to lead to the development of trauma-related guilt compared to exposure to trauma in people who are older than 19. Our hypothesis is based on previous studies that highlighted that exposure to trauma during childhood is more likely to lead to the development of PTSD than exposure to trauma when individuals are older (Ogle et al., 2013). Starting from the assumption that guilt is an important associated feature of PTSD (Pugh et al.,2015) we hypothesized that we would have found significant differences. This discrepancy between our results and our hypothesis could be explained by the fact that, in order to perform the analyses, we only considered the traumatic event that each subject reported as the most stressful he has experienced in his life, and consequently, to answer to this third research question, we only considered the age range of our subject while that traumatic event took place. However, some of our subjects, reported having experienced more than one traumatic event in their life, and often in different life stages. This could explain the lack of significant difference, in terms of developing trauma-related guilt, in people who experienced their most traumatic event during childhood, during adolescence, or during adulthood. This topic needs to be further investigated considering the fact that many subjects have experienced more than one traumatic event in their life, and that these traumas sometimes happened in different life stages.
Finally the results of this study show that guilt proneness is a significant predictor of PTSD symptoms severity, with higher levels of guilt proneness associated with higher levels of PTSD. This confirms our initial hypothesis that subjects with a higher level of guilt proneness experience PTSD symptoms that are more severe compared to subjects with lower levels of

guilt proneness. Our hypothesis was based on the fact that it was found by previous researches that higher levels of guilt and shame are associated with more severe PTSD symptoms in survivors of various traumatic events, including domestic violence, child sexual abuse, and adult sexual assault (Street et al., 2005). However in literature there is uncertainty about wether both shame proneness and guilt proneness are correlated to a more severe experience of PTSD symptoms. In fact, some studies found that shame-proneness is more strongly related to psychopathology symptoms than is guilt-proneness and further investigations found that relations between guilt-proneness and psychopathology symptoms are attributable to shared variance between shame- and guilt-proneness (Tangney et al., 1992). Our study considers only the level of guilt proneness of the subjects and our results show that guilt proneness is a significant predictor of PTSD symptoms severity, independently from shame proneness.

5. Conclusion

In this study we found that the most common traumatic events experienced by the clinical population belong to the category "psychological threats" and they are: "being repeatedly insulted, humiliated or put down by another person", "being repeatedly made to feel unloved, unwelcome or worthless", "being repeatedly neglected, ignored, rejected or isolated", and "being repeatedly bullied. Other than these, two traumatic events with a very high prevalence are "diagnosis with a life-threatening illness of someone close to you or his/her involvement in a potentially lethal accident" and "awful death of someone close to you". According to our results the traumatic events with a lower prevalence are "being sexually assaulted by a parent or a guardian", "being exposed to wars or combats" and "being exposed to a human made disaster". Furthermore from the results of this study it appears that there are not some typologies of traumas with a stronger relationship to the development of trauma-related guilt than others and that there is not a life stage (infancy, adolescence, adulthood) during which being exposed to a traumatic event seems to be more correlated to the development of trauma-related guilt. Finally this study results show that guilt proneness is a significant predictor of PTSD symptoms severity, with higher levels of guilt proneness associated with higher levels of PTSD.

Our study has several strengths that bolster the credibility and impact of the findings. First of all the two instrument Personal Feeling Questionnaire-2 (PFQ-2) and International Trauma Questionnaire (ITQ), that we used to collect data, are validated and reliable measurement instruments and this ensures validity and generalizability of findings. Another strength of this study comes from the fact that the subjects composing the sample come from two different mental health centers, located in two different Italian regions, Lombardia and Veneto. This geographic heterogeneity in our sample increases the generalizability of our findings, at least considering the Italian population. Finally this study is characterized by high reproducibility. In fact, a detailed description of the methodology used allows other researchers to replicate this study. This transparency enhances the credibility of the findings.

However, this study presents several limitations. The first one is related to the methodology used to perform the analysis. In fact, in order to assess wether there was a significant difference between the types of traumatic experiences lived by each subject and the level of trauma-related guilt reported, the only traumatic experience considered in this study was the one that each subject indicated as the most stressful they have lived. However, many of our subjects, were exposed to more than one traumatic experience during their life. The same was done when trying to understand in which life stage being exposed to a traumatic experience shows to be more correlated with the development of trauma-related guilt. Since many of the subjects had experienced more than one traumatic experience during their life, often in different life stages, considering only the traumatic event that was reported as the most stressful is a limitation of the study. Another limitation of this study is that, in order to understand if some traumatic experiences have a higher correlation to trauma-related guilt than others, the 21 traumatic

experiences considered in the ITEM were divided into three categories, “physical threats”, “psychological threats” and “indirect trauma”. The statistical analyses were performed to understand if there was a statistically significant difference between the means of these three categories, instead than considering each traumatic event individually. Furthermore, the ITEM, which is one of the instruments used in order to collect data, is a relatively new psychological tool and in the literature there are not information about the psychometric properties of it tested on an Italian sample. Another limitation of this study is the sample size, in fact, our sample is made up by only 80 participants and this has an impact on the generalizability of our findings. Future researches could take into account all the traumatic experiences lived by each subject, instead than considering only the traumatic event that was reported as the most stressful by each participant. This should be done both when trying to understand if there are some traumatic experiences with a higher correlation to the development of trauma-related guilt than others and when trying to assess in which life stage being exposed to a traumatic event leads to a stronger development of trauma-related guilt. Moreover, future studies could try to consider each of the 21 traumatic experiences considered in the ITEM individually, instead than dividing them in three main categories. Follow up studies could also use a sample with a greater sample size in order to increase the generalizability of findings.

6. References

- Aakvaag, H. F., Thoresen, S., Wentzel-Larsen, T., Dyb, G., Røysamb, E., & Olff, M. (2016). Broken and guilty since it happened: A population study of trauma-related shame and guilt after violence and sexual abuse. *Journal of Affective Disorders, 204*, 16–23. https://doi.org/10.1016/j.jad.2016.06.004
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). https://doi.org/10.1176/appi.books.9780890425596
- American Psychological Association. (n.d.). Stigma. In APA dictionary of psychology. Retrieved from https://dictionary.apa.org/stigma
- Beck, J. G., Jones, J. M., Clapp, J. D., & Olsen, S. A. (2011). Exploring Negative Emotion in Women Experiencing Intimate Partner Violence: Shame, Guilt and PTSD. *Behavior Therapy, 42*(4), 740-750. http://dx.doi.org/10.1016/j.beth.2011.04.001
- Benjet, C., Bromet, E., Karam, E.G., Kessler, R.C., McLaughlin, K.A., Ruscio, A.M., Shahly, V., Stein, D.J., Petukhova, M., Hill, E., Alonso, J., Atwoli, L., Bunting, B., Bruffaerts, R., Caldas-de-Almeida, J.M., de Girolamo, G., Florescu, S., Gureje, O., Huang, Y., Lepine, J.P., Kawakami, N., Kovess-Masfety, V., Medina-Mora, M.E., Navarro-Mateu, F., Piazza, M., Posada-Villa, J., Scott, K.M., Shalev, A., Slade, T., ten Have, M., Torres, Y., Viana, M.C., Zarkov, Z., & Koenen, K.C. (2016). The epidemiology of traumatic event exposure worldwide: results from the World Mental Health Survey Consortium. *Psychological Medicine, 46*(2), 327-343. https://doi.org/10.1017%2FS0033291715001981
- Camden, A. A., Petri, J. M., Jackson, B. N., Jeffirs, S. M., Weathers, F. W. (2023). A psychometric evaluation of the International Trauma Questionnaire (ITQ) in a trauma-exposed college sample. *European Journal of Trauma & Dissociation, 7*(1), 100305. https://doi.org/10.1016/j.ejtd.2022.100305
- Capone, C., Tripp, J. C., Trim, R. S., Davis, B. C., Haller, M., & Norman, S. B. (2020). Comparing exposure- and coping skills–based treatments on trauma-related guilt in

veterans with co-occurring alcohol use and posttraumatic stress disorders. *Journal of Traumatic Stress, 33*(4), 603–609. https://doi.org/10.1002/jts.22538

- Cloitre, M., Shevlin, M., Brewin, C. R., Bisson, J. I., Roberts, N. P., Maercker, A., Hyland, P. (2018). The International Trauma Questionnaire (ITQ): Development of a self-report measure of ICD-11 PTSD and complex PTSD. *Acta Psychiatrica Scandinavica, 138*(6), 536–546. doi:10.1111/acps.12956
- Cloitre, M., Hyland, P., Prins, A., & Shevlin M. (2021). The international trauma questionnaire (ITQ) measures reliable and clinically significant treatment-related change in PTSD and complex PTSD. *European journal of Psychotraumatology, 12*, 1930961. https://doi.org/10.1080/20008198.2021.1930961
- Da Silva, C. E., Pines, A. H., Patterson, L. T., Semple, S., Harvey-Vera, A., Strathdee, A. S., Martinez, G., Pitpitan, E., & Smith R. L. (2022). Psychometric Evaluation of the Personal Feelings Questionnaire-2 (PFQ-2) Shame Subscale Among Spanish-Speaking Females Sex Workers in Mexico. Pubmed central, 29(2), 488-498.
- Di Sarno, M., Di Pierro, R., & Maddeu, F. (2022). Shame- and guilt-proneness in an Italian sample: Laten structure and gender invariance of the personal feeling questionnaire-2 (PFQ-2). *Current psychology, 41*, 276-288. https://doi.org/10.1007/s12144-019-00570-w
- Fedewa, B. A., Burns, L. R., & Gomez, A. A. (2005). Positive and negative perfectionism and the shame/guilt distinction: Adaptive and maladaptive characteristics. *Personality and Individual Differences, 38*(7), 1609–1619. https://doi.org/10.1016/j.paid.2004.09.026
- Feriante, J., & Sharma N.P. (2023). Acute and Chronic mental health trauma. *Statpearls*. https://www.ncbi.nlm.nih.gov/books/NBK594231/
- Fine, N. B., Ben-Zion, Z., Biran, I., & Hendler T. (2023). Neuroscientific account of Guilt- and Shame-Driven PTSD phenotypes. *European journal of psychotraumatology, 14*(2), 1-9. https://doi.org/10.1080/20008066.2023.2202060
- Floen, S. K., & Elklit, A. (2007). Psychiatric diagnoses, trauma, and suicidiality. *Annals of General Psychiatry, 6,* Article 12. https://doi.org/10.1186/1744-859X-6-12
- Graton, A., & Ric, F. (2017). How guilt leads to reparation? Exploring the processes underlying the effects of guilt. *Motivation and Emotion, 41*(3), 343–352. https://doi.org/10.1007/s11031-017-9612-z
- Harder, D. W, & Lewis, S. J. (1987). The assessment of shame and guilt. *Advances in personality assessment, 6,* 89-114. https://psycnet.apa.org/record/1987-97182-006 .
- Hoppen, T. H., Schlechter, P., Arntz, A., Rameckers, S. A., Ehring, T., & Morina, N. (2022). A brief measure of guilt and shame: Validation of the Guilt and Shame Questionnaire (GSQ-8). *European Journal of Psychotraumatology, 13*(2), Article 2146720. https://doi.org/10.1080/20008066.2022.2146720
- James, E. L., Lau-Zhu, A., Clark, I. A., Visser, R. M., Hagenaars, M. A., & Holmes, E. A. (2016). The trauma film paradigm as an experimental psychopathology model of psychological trauma: Intrusive memories and beyond. *Clinical Psychology Review, 47,* 106–142. https://doi.org/10.1016/j.cpr.2016.04.010

- Kip, A., Diele, J., Holling, H., & Morina, N. (2022). The relationship of trauma-related guilt with PTSD symptoms in adult trauma survivors: a meta-analysis. *Psychol Med, 52*(12), 2201-2211. https://doi.org/10.1017%2FS0033291722001866
- Kleber, R. J. (2019). Trauma and public mental health: A focused review. *Frontiers in Psychiatry, 10*, Article 451. https://doi.org/10.3389/fpsyt.2019.00451
- Kubany, E. S., & Watson, S. B. (2003). Guilt: Elaboration of a multidimensional model. *The Psychological Record, 53*(1), 51–90. https://www.researchgate.net/publication/265408861
- McCutcheon, V. V., Sartor, C. E., Pommer, N. E., Bucholz, K. K., Nelson, E. C., Madden, P. A. F., & Heath, A. C. (2010). Age at trauma exposure and PTSD risk in young adult women. *Journal of Traumatic Stress, 23*(6), 811–814. https://doi.org/10.1002/jts.20577
- Miller, M. W., Wolf, E. J., Kilpatrick, D., Resnick, H., Marx, B. P., Holowka, D. W., Keane, T. M., Rosen, R. C., & Friedman, M. J. (2013). The prevalence and latent structure of proposed DSM-5 posttraumatic stress disorder symptoms in U.S. national and veteran samples. *Psychological Trauma: Theory, Research, Practice, and Policy, 5*(6), 501–512. https://doi.org/10.1037/a0029730
- Ogle, C. M., Rubin, D. C., & Siegler, I. C. (2013). The impact of the developmental timing of trauma exposure on PTSD symptoms and psychosocial functioning among older adults. *Developmental Psychology, 49*(11), 2191–2200. https://doi.org/10.1037/a0031985
- Pugh, L. R., Taylor, P. J., & Berry, K. (2015). The role of guilt in the development of post-traumatic stress disorder: A systematic review. *Journal of Affective Disorders, 182*, 138–150. https://doi.org/10.1016/j.jad.2015.04.026
- Quintana, M. I., Mari, J. J., Ribeiro, M. R., & Andreoli, S. B. (2012). Accuracy of the Composite International Diagnostic Interview (CIDI 2.1) for diagnosis of post-traumatic stress disorder according to DSM-IV criteria. *Cad. Saúde Pública, 28*(7), 1312-1318. https://doi.org/10.1590/s0102-311x2012000700009
- Rossi, R., Socci, V., Pacitti, F., Carmassi, C., Rossi, A., Di Lorenzo, G., & Hyland P. (2022). The Italian Version of the International Trauma Questionnaire: Symptoms and Network Structure of Post-Traumatic Stress Disorder and Complex Post-Traumatic Stress Disorder in a Sample of Late Adolescents Exposed to a Natural Disaster. *Frontiers in Psychiatry, 13*, Article 859877. https://doi.org/10.3389%2Ffpsyt.2022.859877

- Shin, K. M., Cho, S., Lee, S. H., & Chung, Y. K. (2014). A Pilot Prospective Study of the Relationship among Cognitive Factors, Shame, and Guilt Proneness on Posttraumatic Stress Disorder Symptoms in Female Victims of Sexual Violence. *The Korean academy of medical Science, 29*(6), 831-836. https://doi.org/10.3346/jkms.2014.29.6.831
- Stotz, S. J., Elbert, T., Müller, V., & Schauer, M. (2015). The relationship between trauma, shame, and guilt: Findings from a community-based study of refugee minors in Germany. *European Journal of Psychotraumatology, 6,* Article 25863. https://doi.org/10.3402/ejpt.v6.25863
- Street, A. E., Gibson, L., Holohan, D. R. (2005). Impact of childhood traumatic events, trauma-related guilt, and avoidant coping strategies on PTSD symptoms in female survivors of domestic violence. *Journal of Traumatic Stress, 18*(3), 245-252. DOI:10.1002/jts.20026
- Szentágotai-Tătar, A., & Miu, A. C. (2016). Individual differences in emotion regulation, childhood trauma and proneness to shame and guilt in adolescence. *PLOS ONE, 11*(11), Article e0167299. https://doi.org/10.1371/journal.pone.0167299
- Tangney, J. P., Wagner, P. E., & Gramzow, R. (1992). Proneness to shame, proneness to guilt, and psychopathology. *Journal of Abnormal Psychology, 101*, 469–478. http://dx.doi.org/10.1037/0021-843X.101.3.469

Appendix

Table S1

Physical threats
1. Diagnosis of a life-threatening illness
2. Your life was threatened with a weapon (knife, gun, bomb etc.)
3. You were physically assaulted by a parent or by a guardian (punched, kicked, mugged, slapped, robbed etc)
4. You were physically assaulted by someone other than a parent or a legal guardian (punched, kicked, mugged, slapped, robbed etc)
5. You were sexually assaulted by a parent or a guardian (rape, attempted rape or forced sex acts)
6. You were sexually assaulted by someone other than a parent or a legal guardian (rape, attempted rape or forced sex acts)
7. You were exposed to wars or combat
8. You were held captive and/or tortured
9. You were involved in an accident where your life was in danger
10. You were exposed to a natural disaster where your life was in danger (hurricane, tsunami, hearthquake)
11. You were exposed to a human-made a disaster in which your life was in danger (terroristic attack, public shooting etc.)

Table S2

Psychological threats
1. You were sexually harassed (unwanted sexualized comments or behaviors)
2. Another person stalked you
3. You were repeatedly bullied (online or not)
4. You were repeatedly insulted, humiliated or put down by another person
5. You were repeatedly made to feel unloved, unwelcome, or worthless
6. You were repeatedly neglected, ignored, rejected or isolated

Table S3

Indirect trauma
1. Awful death of someone close to you
2. Someone close to you was diagnosed with a life-threatening illness or experienced a life-threatening accident
3. You caused extreme suffering or death to another person
4. You witnessed another person experiencing extreme suffering or death