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Research Paper

Traumatic experiences in Lebanon: PTSD, associated identity and interoception

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ABSTRACT

Traumatic events produce profound changes in cognition, physiological arousal, memory, and emotions and divide these integrated functions from one another. How trauma centrality in identity formation and interoceptive awareness modify trauma-related cognitive and somatic disturbances has not been studied.

Aims and Objective: This study proposed that trauma centrality and interoceptive awareness predicted PTSD symptomology while controlling for the type and number of traumas.

Method: Using convenient sampling, this study recruited 554 participants residing in Lebanon for the past 3 years to complete an online survey. The study used four instruments: Post-traumatic Stress Disorder Checklist (PCL-5), Centrality of Events Scale (CES), The Trauma History Screen (THS), and Multidimensional Assessment of Interoceptive Awareness Version 2 (MAIA-2). Hierarchical regression was conducting using SPSS to analyze the data.

Results: When controlling for the number and type of traumas, trauma centrality was shown to be positive significant predictor of PTSD symptomology while interoceptive awareness was shown to be negative significant predictor of PTSD symptomology.

Conclusion: These findings suggest that trauma centrality in post-traumatic identity formation and interoceptive awareness may be key targets in the treatment of patients with PTSD and the clinicians' focus may shift from traumatic event narration to investigating the effect of the traumatic experiences on cognition and somatic experience

Introduction

Almost everyone will go through a traumatic event in life, but not everyone will develop post-traumatic stress disorder (PTSD). PTSD is a syndrome that results from exposure to a traumatic event. Hyper-arousal and hypo-arousal are the two-response patterns in which trauma symptomology tends to be expressed (Levine, 2010; Schore, 2001). Individuals are likely to experience both patterns of response; however, one pattern might be more emphasized. With hyper-arousal, over activation of the sympathetic nervous system occurs, leading to an increase in stress hormones, hypervigilance, high muscle tone, increased heart rate and increased respiration (Schore, 2001). Individuals with PTSD may over interpret these physical sensations as cues of danger and lack of safety (Levine, 2010). With hypo-arousal, the parasympathetic nervous system is over activated, leading to feeling numb, lack of concentration, passivity and feeling disconnected from oneself (Ogden et al.,

2006). These disturbances cause significant distress and functional impairment in occupational and social aspects of life. It is important to note that 90 % of all Americans have experienced at least one traumatic event in their lifetime. However, the lifetime prevalence rate of PTSD is 6.8% lifetime (NIMH : National Institute of Mental Health, 2017). Not every person who has experienced a traumatic event will have PTSD, and several studies have shown that it is not the trauma that predicts PTSD, but rather it is how an individual interprets the traumatic event.

Unlike most Diagnostic and Statistical Manual of Mental Disorder Edition 5 (DSM-5) disorders, the occurrence of an external event is required for a PTSD diagnosis (American Psychiatric Association [APA], 2000). The exposure to a potentially traumatic event such as sexual assault, car accident, combat and so serves as the gatekeeper for the diagnosis and is presumed to be the root cause of the symptoms. Accordingly, research has focused primarily on studies that showed association between trauma characteristics (number of traumas and

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type of trauma) and the incidence and symptomology of PTSD (Jakob et al., 2017; Janoff-Bulman, 1989; Graham et al., 2019). Studies have indicated that a higher number of traumatic experiences is more likely to lead to severe PTSD symptoms, with interpersonal traumata, such as sexual abuse, being particularly predictive (Jakob et al., 2017; Janoff-Bulman, 1989; Graham et al., 2019; Lancaster et al., 2009).

While the initial psychological response to a traumatic event is not necessarily pathological, the persistence of symptoms over time defines the diagnosis of PTSD. According to Judith Herman (2015, pp.34), "The ordinary human response to danger is a complex, integrated system of reactions encompassing both body and mind." The sympathetic nervous system gets aroused which causes the person to go into a state of alerted perception. This state mobilizes the threatened person in fight, flight or freeze state. Traumatic reactions occur when neither escape nor resistance is possible, and the individual remains in an alerted state long after the actual danger is over. Traumatic events produce profound changes in cognition, physiological arousal, memory, and emotions, and divide these integrated functions from one another. For instance, a traumatized person may recall every detail of a traumatic event without emotion or may become vigilant without knowing why. This fragmentation leads to a state of disconnection from one's own thoughts, emotions, and body sensations (Herman, 2015). Cognitive and somatic disturbances to the sense of self are thought to reflect the effect of traumatic events. Cognitively, negative core beliefs about oneself such as "I feel like an object", "I will never be able to feel normal again", "I don't know myself", or even "I am damaged beyond repair", are commonly experienced (Cox et al., 2014, pp 302). Somatically, traumatic experiences through physical representations such as general fatigue, lower back pain, muscle ache, palpitation and increased perspiration are common manifestations of traumatic experiences (Graham et al., 2019). In addition, trauma survivors often report somatically based alterations in relation to self-experience such as feeling disembodiment reported like "I feel dead inside", "I feel as if I am outside my body", "I feel like my body does not belong to me" or "I feel like there is no boundary around my body" (Frewen & Lanius, 2015, pp 27). In the current study, cognitive and somatic disturbances were further explored through the lens of trauma centrality and interoceptive awareness.

In recent years, research has explored the influence of trauma centrality on the incidence and symptomology of PTSD. Trauma centrality, or event centrality, was first introduced by Brensten and Rubin (2007). It is defined as the "extent to which a person believes an event or experiences to be a key component of their identity" (Berntsen & Rubin, 2007, pp. 419). Three components outline trauma centrality. First, the traumatic event becomes a lens in which one views everyday experiences and a reference for attributions about the world. Second, the memory of the traumatic experience is easily accessible and often re-experienced due to external and internal cues. Third, the individual will see the traumatic experience as a personal turning point and a key component for one's identity (Berntsen & Rubin, 2007). Studies have found a positive association between trauma centrality and PTSD symptomology, even after controlling for demographic variables and other psychological factors (Bernsten & Rubin 2007; Robinaugh & McNally 2011).

In addition, there has been a growing emphasis on the role of the body in trauma-focused psychotherapy (Fogel, 2013; Langmuir et al., 2012; Mehling et al., 2012; Ogden et al., 2006). In the last decade, body-oriented therapeutic models have integrated body sensations and movement with emotions, thoughts, and behaviors. Therapeutic approaches, that increase interoceptive body awareness and integrate a focus on bodily sensations, have shown improvements in psychological well-being. (Langmuir et al., 2012; Price et al., 2012). Interoceptive has been defined "as the process by which the nervous system senses, interprets, and integrates signals originating from within the body, providing a moment-by-moment mapping of the body's internal landscape" (Khalsa et al., 2018); interoceptive awareness, also operationalized as interoceptive sensibility (Garfinkel & Critchley, 2013), is the small component of interoception that humans can be aware of

(Mehling et al., 2012). Individuals with PTSD tend to disconnect the self from the body and others (van der Kolk, 2014), which may be related to a trauma's effect on the ability to recognize and regulate emotions (Sedeño et al., 2014). Interoceptive awareness contributes to the construction of an integrated sense of self which includes feeling of agency, presence, and body ownership (Garfinkel et al., 2016). Following traumatic events, many survivors have altered interoceptive processing and struggle with interoceptive awareness, specifically emotional awareness and emotion regulation (Harricharan et al., 2021). Mindful awareness of bodily sensations has been found to reduce hyperarousal and PTSD symptoms (Colgan et al., 2017; Lanius et al., 2015; Mehling et al., 2018).

However, studies on interoceptive awareness and its direct relationship with PTSD are limited by small sample sizes and/or inaccurate measurements. The current study aims to replicate and expand upon previous research by examining the predictive role of trauma centrality on PTSD symptoms, while controlling for the number and type of trauma experienced. Additionally, the study seeks to investigate the direct relationship between interoceptive awareness and PTSD symptomology.

The study holds particular significance in the context of Lebanon (described below), where individuals have been exposed to ongoing and recurrent traumatic events. Previous studies on PTSD in Lebanon have focused on specific groups rather than the general population. By examining predictors of PTSD symptomology from cognitive and somatic perspectives, this study aims at providing insight for tailoring interventions and targeted treatments to expand the treatment options for PTSD. Additionally, the findings have implications for community interventions in Lebanon, considering the population's exposure to recurrent traumata.

On the 4th of August 2020, 2750 tons of ammonium nitrate exploded that were stored at the port of Beirut. Hundreds of people were killed, thousands were injured and a hundred thousand were displaced from their homes (Cheaito & Al-Hajj, 2020). The explosion occurred at 6.07 PM, at the end of a working day, when friends and families usually reunite at home. This explosion shattered the most basic sense of trust and safety by violating people's safest spaces. Action-oriented behaviors were observed in the aftermath of the port explosions. Hundreds of volunteers provided help in clearing debris, covering broken windows and doors, offering food, water, and shelter. Embrace, a national non-governmental organization, collected data from 903 individuals through the national suicide prevention and emotional support lifeline. Eighty-three percent reported loss of pleasure in the things they used to love, accompanied with a feeling of sadness almost every day. Seventy-eight percent reported being worried and anxious every day, and more than 84 % felt hyper-aroused and sensitive to loud noises. Still more than one month after the blast, 55% of people reported feeling very sad and forty-six percent reported being anxious almost every day (El Hayek & Bizri, 2020).

Moreover, in the past two years, Lebanon has been suffering from economic crisis and a health pandemic. Lebanon is the third highest in-debt country in the world (Bosqui, 2020). In February 2020, the first COVID-19 positive patient was diagnosed, which led to shutting down universities, schools, restaurants, cinemas, shops, and parks (Bosqui, 2020). Many residents went through a life-threatening hardship due to the inability of daily works to earn money and the sharp devaluation of the Lebanese lira (Devi, 2020). An online study in 502 participants revealed that the combined exposure to financial hardship and pandemic-related fears increased anxiety and stress more than the impact of each hardship alone (Salameh et al., 2020).

Aside from social justice that is needed to alleviate Lebanese pain, these on-going traumas and stressors mandate that researchers focus more on understanding the differences between one-time traumas and ongoing cumulative traumas. This also necessitates clinicians to work on developing collective therapy approaches, and hopefully it will urge the government and other NGOS to address collective ongoing traumas in addition to ongoing life stressors through their services.

Rationale

Based on El Hajj's literature review (2021), Lebanese people have an increasing risk for developing PTSD as they have been exposed to collective, ongoing, and recurrent traumatic events. Moreover, studies on PTSD in Lebanon are limited to few studies with small samples pertaining to specific groups (not the general population). While previous literature has widely documented the relations between trauma characteristics (number and type of trauma) and the incidence and symptomology of PTSD (Jakob et al., 2017; Janoff-Bulman, 1989; Graham et al., 2019), studies recently has been moving from studying the effects of trauma characteristics on PTSD towards investigating how trauma is assimilated in one's identity (trauma centrality) and its effects on PTSD (Bernard et al., 2015; Brensten & Rubin, 2006, 2007; Robinaugh & McNally, 2011). Bernard et al. (2015) also documented that trauma centrality has a wider influence on PTSD than the mere characteristics of the traumatic event. Recent literature also documented how trauma alters the interoceptive processing of individuals (Lanius et al., 2015; Nicholson et al., 2016, and Shaan et al., 2019). Moreover, intervention research depicted how increasing interoceptive awareness led to a decrease in PTSD symptoms (Nukrich et al., 2019). However, such intervention studies are limited in number, use inaccurate measurement of interoceptive awareness, and recruit small samples. There is no study that showed any direct relationship between interoceptive awareness and PTSD. As such, the current study has two main objectives:

1 To conceptually replicate and build on the study done by Bernard et al. (2015) showing trauma centrality as a predictor for PTSD while controlling for number of traumas, by adding type of trauma as a second controlling variable. The purpose of replication is further discovery, exploration while assuming the validity of the study.
2 To fill the gap in the literature by studying the direct relationship between interoceptive awareness and PTSD symptomology.

Significance

This study aimed to uncover the influence of trauma centrality and interoceptive awareness on PTSD while controlling for trauma characteristics (number and type of trauma). The weight of this study is that it filled the gaps in the literature, as mentioned in the rationale section. Bernard et al. (2015)'s study revealed that trauma centrality predicted PTSD, while controlling for number of traumas. However, it did not establish a relation between trauma centrality and PTSD while controlling for the type of trauma, which is also an important characteristic of trauma as depicted in the literature and may therefore influence the reported findings. Moreover, Mehling et al. (2012) found that interventions such as yoga or mindfulness that improve interoceptive awareness also decrease PTSD symptomology without studying the direct relation between interoceptive awareness and PTSD. Qualitative studies with small sample sizes by Neukirch et al. (2007) and Colgan et al. (2017) revealed that improved interoceptive awareness is associated with improvement in PTSD symptomology. This study is the first study to investigate effect of trauma centrality on PTSD while controlling for two characteristics of trauma (type and number of trauma). This study is also the first study to investigate the relation between interoceptive awareness and PTSD quantitatively in a large sample. In other words, this study sheds light on the importance of studying how the cognitive integration of trauma in the mind (trauma centrality) and somatic assimilation of trauma in the body (interoceptive awareness) influence the incidence and symptomology of PTSD.

On the other hand, most of the research in Lebanon on PTSD evaluates the prevalence and predictors of PTSD in specific groups, such as Lebanese residing in the south or adolescence, and not the general population. As such, this study would be the first to evaluate the predictors of PTSD symptomology from both cognitive and somatic perspectives in the Lebanese general population.

Currently, cognitive behavior therapy (CBT) is the first line evidence-based treatment for PTSD. However, traditional CBT rarely emphasizes on the effect of trauma on the body. Therefore, the findings of this study shed light on whether somatic perspectives are predictors of PTSD symptomology. This contributes to techniques tailored for the treatment of PTSD, such as somatic experiencing techniques and mindfulness. Finally, the examination of predictors of PTSD in Lebanon also has sound implications on developing community-interventions catered for Lebanese people who are exposed to recurrent, ongoing, traumas

Hypotheses and research question

Based on the above literature review, the following two hypotheses were investigated:

H1. Trauma centrality is a positive predictor of PTSD severity while controlling for type and number of traumas experienced among a Lebanese sample.

H2. Interoceptive awareness is a negative predictor of PTSD severity while controlling for type and number of traumas experienced among a Lebanese sample.

Moreover, this study aimed to explore the relation between trauma centrality and interoceptive awareness. To my knowledge, based on the literature review conducted for this study, the relation between both variables was not explored in previous studies and thus the research question is not supported through empirical evidence. However, trauma informed psychotherapy recently shifted from focusing on event narration to focusing on the effect of the trauma on one's perception, and thus addressing one's trauma centrality (Fisher, 2017, p. 32). The new modalities used, such as mindfulness, work through enhancing interoceptive awareness to reduce cognitive distortion and thereby reduce trauma centrality. Hence, this study explored the following research question:

R1. What is the relationship between trauma centrality and interoceptive awareness?

Methods

Research design

This study was an observational study based on an online survey (developed using Psytoolkit). The study protocol was approved by the Institutional Review Board of the Haigazian University (June 20th, 2022). We posted adds on social media platforms (Facebook, Instagram, Twitter, and LinkedIn; September 6th, 2022). Interested participants were directed to the informed consent and the survey questionnaires in a counterbalanced way using the Psytoolkit. Skipping items was not allowed. End date of data collection was October 9th, 2022.

Participants

From September 2022 to October 9th 2022, we recruited a convenience sample from the Lebanese general population. To be included in the study, participants had to be Lebanese adults (18 years of age and older) residing in Lebanon for the past 3 years, who had witnessed recent traumatic events such as the explosion in Beirut, the Lebanese revolution in 2019, the COVID epidemy, and the ongoing economic crisis. We excluded refugees residing in Lebanon, since this populations was exposed to different traumatic events related to their displacement and status in Lebanon. The online survey was posted on various social media platforms (Instagram, Facebook, Twitter, and LinkedIn). The sample size of 518 participants for the study was calculated using G-power 3.1 assuming la small to medium effect size f2=0.03, a power of 0.95, and a 5% probability of error in multiple regression (Faul, Erdfelder, Buchner, and Lang, 2009).

Instruments

The online study included an informed consent form, a demographic sheet, and questionnaires that were forward and backward translated to Arabic.

The Trauma History Screen (THS) (Carlson et al., 2011) is a 14-item questionnaire that assesses the number and type of experienced traumatic or "stressful life events", such as physical or sexual assault, natural disasters, and death of a significant other, using yes/no question. Total scores for the THS were determined by adding up the frequency counts. The THS has good to excellent reliability (Carlson et al., 2011) and high convergent validity with the Traumatic Life Events Questionnaire scores for young adults ($r = 0.73$), adults ($r = 0.76$), and veterans ($r = 0.77$); (Carlson et al., 2011).

Centrality of Events Scale short version (CES; Brensten & Rubin, 2006) is composed of 7 items that measures how likely a given stressful event is integrated in one's personal identity, rated using a 5-point Likert scale from 1 for "totally disagree" to 5 for "totally agree". A sample item of this scale is: "I feel that this event has become part of my identity." The scoring of this scale is done by summing up the scores on individual items. The CES scale also has excellent internal consistency with $\alpha = .93$ (Bernsten & Rubin, 2006). Additionally, the CES scale good construct and face validity. The CES is correlated to anxiety and depression scales and is significantly correlated with PTSD symptoms independent of the other scales (Berntsen & Rubin, 2007).

The Multidimensional Assessment of Interoceptive Awareness Version 2 (MAIA-2; Mehling et al., 2018) is composed of 37 items and measures eight key constructs of interoceptive awareness; (1) Noticing: awareness of neutral, comfortable, and uncomfortable body sensations, (2) Non-Distracting: the inclination to distract oneself or ignore pain and discomfort sensations, (3) Not-worrying: feeling worry or emotional distress in the presence of pain or discomfort sensations, (4) Attention Regulation: being able to control and sustain attention to bodily sensations, (5) Emotional Awareness: being aware of the connection between emotional states and bodily sensations, (6) Self-Regulation: being able of regulating bodily distress by being attentive to bodily sensations, (7) Body Listening: being an active listener to the body for insight and (8) Trusting: experiencing the body as a trustworthy and safe environment. Participants are asked to rate the 37 items using a 5-likert scale from 0 for "never " to 5 for "always". A sample item of the interoceptive awareness scale is: "When I am caught up in my thoughts, I can calm my mind by focusing on my body/breathing". The scoring of the interoceptive awareness scale was done by averaging the items on items pertaining to each subscale. Being high on MAIA-2 is considered as a beneficial trait. The internal consistency of the subscales is acceptable to good (Mehling et al., 2018. The Cronbach alpha for the total score revealed strong internal consistency $\alpha = .92$. The MAIA has been validated in numerous studies and countries (see website: https://osher.ucsf.edu/research/maia)

Post-traumatic Stress Disorder Checklist (PCL-5; Bernard et al., 2015; Weathers et al., 1991) is a 20-item self-reported questionnaire that assesses the symptoms of PTSD on a 5-point Likert scale from 1for "not at all" to 5 for "extremely" on how much the given symptom has bothered them in the last month. An example item of this scale is "In the past month, how much were you bothered by blaming yourself or someone else for the stressful experience or what happened after it"? The scoring of the PCL-5 can be obtained using a total symptom severity score which can be deduced by summing the individual scores of the 20 items (range from 0 to 80). The PCL-5 has shown excellent reliability (Orsillo, 2001) and robust convergent and discriminate validity (Blevins et al., 2015).

To translate the THS, CES and MAIA-2 to Arabic and back translate them to English, a committee consisting of three psychology students with a history in scales translation was created. The first student translated the scales from English to Arabic, the second student translated the scales from Arabic to English, and the third student compared the back translation and the original translation. In a subsequent committee meeting they discussed all needed changes. A faculty advisor and the first author reviewed the Arabic translation scales and the back translation scales with the original scales to determine any final changes. The questionnaires were pilot tested with 30 participants who reported good item comprehension and no difficulty in answering them.

Data analysis

The data collected from the Psytoolkit were entered into SPSS version 27. Before executing main data analysis, preliminary analysis was conducted to check for missing value analysis, reliability of scales and subscales, univariate and multivariate outliers, outliers in the solution, and influential cases. Following that, sample, and scale descriptive were provided using range, mean, and standard deviation for scale variables. Main analysis was conducted through Hierarchical linear regression using two blocks. The aim of this regression was to uncover the variance explained by trauma centrality and interoceptive awareness on PTSD while controlling for number and type of trauma.

Results

The purpose of this quantitative study was to determine possible predictors of PTSD symptomology among a sample of Lebanese who have been residing in Lebanon for the past three years.

The final sample size was 554 participants (22.9 % male, 76.5% females, 0.35% Queer, 0.17% transwoman, and 0.17% as other) who have been residing in Lebanon for the past three years continuously. Age ranged from 18 to 64, with most participants between 18 and 28 years of age (78.7%). 243 participants reported bachelor's degrees (43.9%), 182 participants master's degrees (32.9%), 117 participants high school degrees (21.1%), and 12 participants PhD degrees (2.2%). For the purpose of the study, the 14 trauma categories were divided into two groups: non-Interpersonal trauma (NIT) and Interpersonal trauma (IT). The NIT group included exposure to natural disaster, life-threatening accident, witnessing serious accidents or death, loss of possessions, and having or witnessing other stressful accidents. The IT group included exposure to sexual abuse or harassment as adult or child, physical assault, threatened assault with a weapon, abandonment by spouse, parent, or partner, death of family of a friend (See Table 1).

Table 2 shows the results for the PCL, CES and MAIA-2 scales. For PCL, the overall mean was $M = 33.18$ with an SD $= 19.1$, possible range [0-100]. Scores on the CES scale had a mean of $M = 24.4$ with an SD $= 6.06$, possible range [7-35] indicating that the sample had above average scores. For MAIA, the overall mean was $M = 96$ with an SD $= 23.2$, possible range [0-185] indicating that the sample exhibits average interoceptive awareness scores. As for the number of traumata, the mean for lifetime traumata was $M = 15$ with SD $= 22$.

Internal reliability of all scales was determined using Cronbach's Alpha. Results indicated that all scales were reliable (Table 3).

Table 1
Sample descriptive.

	Number of Participants	% Of Participants
Gender		
Male	127	22.9
Female	427	76.5
Other	3	0.6
Age		
18-28	436	78.7
29-64	118	21.4
Highest education		
High school	117	21.1
Bachelor's degree	243	43.9
Master's degree	182	32.9
PhD	12	2.2

Table 2
Scale descriptive.

	N	Minimum	Maximum	Mean	SD
PCL scale [0,100]	554	0	80	33.18	19.1
CES scale [7,35]	554	7	35	24.4	6.06
MAIA-2 Scale [0,185]	554	26	175	96.87	23.2
THS (number of traumata)	554	0	181	15.5	22.6

Table 3
Internal reliability of scales: Cronbach's alpha.

	Cronbach's Alpha Arabic	Cronbach's Alpha Original	N
PCL-5	.94	.92	554
MAIA2	.88	.92	554
CES	.84	.93	554

Correlations between predictors (trauma centrality, interoceptive awareness) and the outcome (PTSD severity)

Spearman's Rho correlation tests showed a significant positive medium to large correlation between trauma centrality and PTSD severity of $r_s = 0.406$, $p < 0.001$ and a significant negative correlation between interoceptive awareness and PTSD severity of $r_s = -0.182$, $p < 0.001$. However, there was no relationship between trauma centrality and interoceptive awareness ($r = -.028$, $p = .506$). There was a significant positive relationship between trauma centrality and number of traumata; $r_s = 0.275$, $p < 0.001$.

Hierarchical regression analysis

Hierarchical Regression analysis was conducted with bootstrapping, 95% confidence intervals and the PCL-5 scale as the dependent variable. Block 1 included number of traumata, interpersonal trauma, and non-interpersonal trauma. Block 2 included trauma centrality and interoceptive awareness. Block 1, the variables number of lifetime trauma, interpersonal traumata, and non-personal traumata, predicted 13.1 % of the variance in PTSD

$F(3,554) = 27.731$, $p < .001$, $R^2 = 0.131$, R^2 *Adjusted* $= 0.127$.

In Block 2 where trauma centrality and interoceptive awareness were added, the model predicted 28.1% of the variance in PTSD.

$F(2, 554) = 56.397$, $p < .001$, $R = .529$, *Adjusted* $R^2 = .281$.

The R^2 change from Model 1 to Model 2 indicates that trauma centrality and interoceptive awareness predicted an additional 14.8% of the variance in PTSD (Table 4). Analyses were adjusted for number of traumata.

$((F(5,554) = 42.549, p < .001)$

Individually, trauma centrality ($\beta = .361$, $t(554) = 9.55$, $p < 0.00$), interoceptive awareness ($\beta = -.181$, $t(554) = -4.91$, $p < 0.001$), both adjusted for type and number of traumata, and interpersonal traumata ($\beta = .261$, $t(554) = 5.46$, $p < 0.001$) were significant predictors of PTSD. A 1-point increase in trauma centrality increased PTSD severity by .361 points. Similarly results indicated that those who scored high on interoceptive awareness scale scored low on PCL. A 1-point increase in the MAIA total score decreased PTSD severity by 0.183 points (Table 5).

When comparing total number of traumata, number of interpersonal

Table 4
R, R square, adjusted R square.

Model	Variable	R	R²	R²Change
1	Number of traumata, Interpersonal Traumas, Non-interpersonal traumata	.362**	.131	
2	Trauma centrality, Interoceptive awareness,	.529**	.280	.148

** $p < .001$

Table 5
Individual predictors of PTSD severity: Coefficient with bootstrap.

Model	B	95% CI for B		SE B	β
		LL	UL		
1					
Constant	21.84**	18.14	25.08	1.74	.094*
# Of traumata	.079*	.002	.164	.03	.261**
Interpersonal T	3.14**	1.98	4.30	.57	.079
Non-Personal T	.072	-.102	2.09	.568	
2					
Constant	11.22**	2.44	20.13	4.46	.085*
# Of traumata	.07*	.006	.138	.033	.164**
Interpersonal T	1.96**	.928	3.08	.545	.075
Non-Personal T	.92	-.056	1.91	.517	-.181**
MAIA-2	-.148	-.209	-.089	.030	.361**
CES	1.142	.878	1.389	.126	

Note. Model = "Enter" method in SPSS Statistics; B = unstandardized regression coefficient; CI = confidence interval; LL = lower limit; UL = upper limit; SE B = standard error of the coefficient; β = standardized coefficient; R² = coefficient of determination; ΔR² = adjusted ΔR².
* $p < .05$.
** $p < .001$.

trauma and number of non-interpersonal traumata, the number of interpersonal traumata was the strongest predictor of PTSD with $p < .001$ followed by the interpersonal trauma with $p < 0.05$ and no significance on number of non-interpersonal trauma. Such that, with every 1 standardized unit increase in number of interpersonal traumata, PTSD symptoms increased by 0.261 standardized unit. Also, with every 1 standardized unit increase in total number of traumata, PTSD symptoms increase by 0.094 standardized unit.

In conclusion, the data analysis showed that both trauma centrality and interoceptive awareness were significant predictors of PTSD symptomology while controlling for number of traumata and number of interpersonal and non-interpersonal traumata, and therefore both hypotheses were supported.

It is important to note that, since most participants had both interpersonal and non-personal traumata, therefore the above analysis was controlling for the number of interpersonal and personal traumata.

Exploratory analysis

To be able to control for type of traumata, an exploratory hierarchical regression analysis was done with PCL-5 scores as dependent variable. Block 1 included 14 types of traumata and number of lifetime traumata. Block two included trauma centrality and interoceptive awareness. In Block 1, the variables number of lifetime trauma and the 14 types of traumata, predicted 19 % of the variance in PTSD ($F(15,554) = 8.440$, $p = <.001$, $R^2 = .190$).

In Block 2 where trauma centrality and interoceptive awareness were added, the model predicted 31.7% of the variance in PTSD (F(2, 554) = 49.411, $p = . <001$, adjusted $R^2 = .295$).

The R^2 change from Model 1 to Model 2 indicates that trauma centrality and interoceptive awareness predicted an additional 12.6% of the variance in PTSD (Table 6).

$(F(17,554) = 14.600, p < .001)$.

Assessment of the coefficients table, the analysis of model 1 which included the control variables (14 types of traumata and numbers of

Table 6
R, R square, adjusted R square.

Model	Variable	R	R²	R²Change
1	Number of traumata, 14 types of traumata	.436**	.190	
2	Trauma centrality, Interoceptive awareness	.563**	.317	.126

** $p < .001$

traumata), showed that the total number of traumata was not significant predictor of PTSD. The analysis also showed the following type of traumata to be significant predictor of PTSD

- T 2: Been in a really bad accident at work or home? ($p < 05$)
- T 4: Been hit and kicked as a child ($p < .05$)
- T 12: sudden event that made you feel very scared, helpless, and horrified. ($P < .001$)
- T: 14: being abandoned by spouse, partner parent or family. ($P < .001$)

However, the analysis of model 2 which included the control variables, interoceptive awareness and trauma centrality, showed that trauma centrality ($b = .337$, $t(554) = 8.55$, $p < 0.001$) interoceptive awareness ($b = -.182$, $t(554) = -5.01$, $p < 0.001$), number of lifetime trauma ($b = .073$, $t(554) = 1.7$, $p = .046$), type 2 trauma ($b = .073$, $t(554) = 3.20$, $p = 0.01$) Type 12 trauma ($b = .104$, $t(554) = 2.7$, $p < 0.001$) and type 14 trauma ($b = .123$, $t(554) = 2.9$, $p < 0.001$) are significant predictors of PTSD. Interestingly, type 4 trauma (been hit and kicked as a child) was not a significant predictor of PTSD after the addition of trauma centrality and interoceptive awareness. On the other hand, the number of traumata became a significant predictor of PTSD after the addition of trauma centrality and interoceptive awareness (Table 7).

These results indicate that a 1-point increase of trauma centrality increases PTSD severity by .337 points. Therefore, Hypothesis 1 for trauma centrality as positive predictor of PTSD severity while controlling for type and number of traumata was supported. These findings

Table 7
Coefficients with bootstrap for exploratory analysis.

Model	B	95% CI for B		SE B	β
		LL	UL		
1					
Constant	17.99**	13.96	22.23	2.19	.073
# Of traumata	.061	-.013	.136	.038	.063
Trauma 1	2.473	-.656	5.619	1.600	.115*
Trauma 2	4.391	.924	7.548	1.716	-.038
Trauma 3	-1.501	-4.495	1.549	1.520	.091*
Trauma 4	3.639	.134	7.004	1.750	.012
Trauma 5	.558	-4.015	4.870	2.274	.038
Trauma 6	1.761	-2.310	5.803	2.099	.075
Trauma 7	3.525	-.722	7.601	2.107	.000
Trauma 8	-.010	-4.051	4.046	2.103	-.005
Trauma 9	-.298	-4.900	4.174	2.342	.035
Trauma 10	1.564	-1.946	5.139	1.780	-.041
Trauma 11	-1.574	-4.478	1.554	1.542	.154**
Trauma 12	7.540	3.533	11.293	1.953	-.036
Trauma 13	-1.415	-4.503	1.754	1.608	.199**
Trauma 14	7.820	4.491	11.189	1.736	
2					
Constant	11.019	1.583	20.358	4.764	.073*
# Of traumata	.062	-.002	.123	.032	.051
Trauma 1	1.984	-.935	5.030	1.482	.127*
Trauma 2	4.846	1.804	7.922	1.626	-.038
Trauma 3	-1.521	-4.328	1.174	1.443	.076
Trauma 4	3.037	-.315	6.020	1.612	.011
Trauma 5	.504	-3.765	4.722	2.141	.012
Trauma 6	.539	-3.216	4.536	1.954	.048
Trauma 7	2.289	-1.439	5.889	1.908	-.003
Trauma 8	-.186	-3.897	3.601	1.908	.035
Trauma 9	2.140	-1.980	6.358	2.173	.005
Trauma 10	.233	-3.016	3.410	1.668	-.050
Trauma 11	-1.909	-4.677	1.032	1.424	.104*
Trauma 12	5.092*	1.193	8.878	1.855	-.029
Trauma 13	-1.125	-4.136	1.709	1.479	.123*
Trauma 14	4.815*	1.447	8.186	1.688	-.182**
MAIA-2	-.150 **	-.216	-.085	.033	.337**
CES	1.067**	.804	1.332	.135	

* $p < .05$.
** $p < .001$.

indicated that those who scored high on interoceptive awareness scale scored low on PCL. With every 1-point increase in interoceptive awareness, PTSD symptoms decreases by 0.182. Therefore, H2 for interoceptive awareness as a negative predictor of PTSD symptomology while controlling for type and number of traumata was supported.

In conclusion, the data analysis showed that both trauma centrality and interoceptive awareness were significant predictors of PTSD symptomology while controlling for number of traumata and 14 types of traumata.

Discussion

This aim of this research study was to investigate the influence of trauma centrality and interoceptive awareness on PTSD while controlling for the number and type of traumata. Effective interventions are needed in Lebanon more than ever, due to the ongoing crisis and traumatic events for the past three years. Therefore, this study recruited 554 participants using convenient sampling who have been residing in Lebanon for the past 3 years and asked them to complete an online survey. The main findings of this study confirmed both hypotheses; trauma centrality and interoceptive awareness were significant predictors to PTSD severity when controlling for number and type of trauma.

Regarding trauma centrality, these findings are consistent with a study done by Brensten and Rubin (2007) which showed that higher levels of trauma centrality were correlated with higher levels of PTSD severity in 247 Danish psychology students. Even though in the current study, 49% of the participants were college students, more than 50 % of the participants were non-college students, of age above 21 years old. Therefore, the current study potentially allows a preliminary generalization to the general population. Moreover, according to previous literature, trauma centrality predicted PTSD severity in women with history of sexual abuse (Robinaugh & McNally, 2011). The current study's result suggested that trauma centrality predicted PTSD severity even when controlling for 14 types of traumata (including sexual abuse). This is the first known study that showed that high trauma centrality may predict PTSD severity irrespective of trauma type.

In addition, one of the main aims of this research was to conceptually replicate the study done by Bernard et al. (2015) that showed that people with high trauma centrality had high level of PTSD severity while controlling for number of traumata. When additionally controlling for the type of trauma, results from our current study were still consistent with Bernard el al findings (2015). Thus, trauma centrality appears to be a significant predictor of PTSD severity while controlling for number and type of traumata. These findings suggested that the effect of the trauma on the individual identity may be more significant than the mere exposure to any type of trauma itself. Therefore, the consequences of a trauma should be further explored from the perspective of identity to better understand in which ways the traumatic events are integrated as part of the identity (Berntsen & Rubin, 2006; Conway, 2005; Neimeyer et al., 2006). We need to further explore what distinguishes individuals who incorporate the traumatic experience in their own personal identity from those who do not, which might ultimately help us in understanding the variety of reactions when faced with the same traumatic event.

On the other hand, interoceptive awareness was found to be a negative significant predictor of PTSD, indicating that participants who had high level of interoceptive awareness tend to have lower symptoms of PSTD even when controlling for type and number of traumata. To our knowledge, this was the first study to show a direct cross-sectional relationship between interoceptive awareness and PTSD. These findings are in line with previous studies demonstrating that a mindfulness-based approach and trauma sensitive yoga may improve interoceptive awareness and lead to a decrease in PTSD severity in veterans (Mehling et al., 2018; Colgan et al., 2017). A strength of the current study with its large sample including individuals with diverse traumatic events is that it included a non-student population to support a potential

generalization of the population.

The number and type of traumata were shown to be significant predictors to PTSD severity in the first hierarchical regression with interpersonal trauma being a higher predictor of than non-interpersonal trauma. These findings were also consistent with previous findings which suggested that interpersonal trauma, specifically sexual abuse, was a higher predictor of PTSD symptomology than non-interpersonal trauma (Jakob et al., 2017). However, exploratory analysis showed that there may be 4 specific types of traumata that predict PTSD symptoms. Two of them were interpersonal traumata (T 14: abandonment by spouse, partner parent or family" " T 4: severely hit and kicked as a child) and two were non-interpersonal traumata (T 12: a sudden event that made you feel very scared, helpless, and horrified"," T 14: a really bad accident at work or at home").

Yet, when adding trauma centrality and interoceptive awareness to the analysis, being severely hit and kicked as a child was not a significant predictor of PTSD symptomology anymore. Theoretically, identity formation is disrupted by childhood trauma, because basic survival takes precedence over the natural development of the self. In fact, the identity for adults with unresolved childhood trauma is often focused on survival and establishing safety. At the expense of more flexible self, individuals with childhood trauma may identify with a "traumatic self" and becomes disconnected from themselves. Hence, unresolved childhood trauma could be characterized by high trauma centrality and low interoceptive awareness. Thus, it is conceivable that when trauma centrality and interoceptive awareness were added to the exploratory analysis, the childhood trauma may become non-significant due to mediation.

According to Judith Herman, the key feature of post-traumatic stress disorder is the dialectic of opposing psychological states which creates an oscillating rhythm. The first state is the intrusive response which is categorized as intrusive thoughts, hypervigilance, flashbacks, and nightmares, while the second state is the constrictive response which is categorized as dissociation, numbness, depersonalization and derealization. Since, neither intrusive nor constrictive response allow for integration of the traumatic event, the alteration between the two extreme states can be understood as an attempt to balance the two, a balance that a traumatized person might lack (Herman, 2015). When a traumatic event becomes central to one's identity, the memory of the traumatic experience is easily accessible and often re-experienced. Therefore, having trauma centrality might aggravate the intrusive responses and increase suffering to a diagnostic level. On the other hand, lack of interoceptive awareness, might aggravate the constrictive response and the feeling of numbness, and dissociation, which also may increase the suffering to a diagnostic level. Since there is no relationship between intrusive response and constrictive response, the finding in this study of no association between trauma centrality and interoceptive awareness may be comprehensible. Nevertheless, trauma centrality and interoceptive awareness appear to be independently important predictors for PTSD symptomology.

Furthermore, according to Judith Herman, the oscillating responses usually undergo a gradual evolution over time. In the first few months following the traumatic event, intrusive response predominates, but over time intrusive symptoms start to diminish and a more constrictive response predominates (Herman, 2015). In Lebanon, one might argue that due to the current state of ongoing stressful events, intrusive responses might remain predominant over constrictive response even after years. Thus, in the Lebanese context, it may be understandable to have trauma centrality more significantly correlating with PTSD symptomology relative to interoceptive awareness.

Clinical implications

Given the modest findings of this study, the reported results provide a suggestion for clinicians to shift their focus from traumatic event narration to investigating the effect of the traumatic experiences in one's

cognition and somatic sensation. Targeting trauma centrality and interoceptive awareness in the treatment plan for PTSD may be helpful. Approaches that aim at targeting these parameters are available and have been used for PTSD, such as accelerated experiential dynamic psychotherapy (AEDP), and other so-called third wave therapies, such as acceptance and commitment therapies (ACT) or Somatic Experiencing.

Limitations

There are several important limitations: Due to convenient sampling, individuals with no access to social media could not be included in the study and, thus, findings cannot be generalized to the entire Lebanese population. Another limitation is that the scale for screening the number of traumata is low in sensitivity. For instance, one participant wrote "100" when asked how many times she was hit or injured badly as a child, limiting the sensitivity of the scale. Another limitation of the study is that it used a non-experimental, cross-sectional design, which only assesses correlations between variables and does not allow inference about causal relationships. In addition, the Arabic version of the CES, MAIA-2, and THS scales were not previously validated in a bigger sample size.

Future directions

A recommendation for future research would be to use a random selection instead of convenience sampling, to explore how trauma centrality and interoceptive awareness are correlated with PTSD on a larger scale, in different age groups, and in different populations. Another recommendation is to utilize an experimental design using somatic experiencing, AEDP model or other models that incorporate trauma centrality and interoceptive awareness and evaluate its effect on PTSD symptomology. Future research may also investigate other specific moderators or mediators such as attachment style, age, or gender, between the trauma centrality or Interoceptive awareness and PTSD symptomology.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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