

# Traumatology

## **Psychopathology, Risk, and Resilience Under Exposure to Continuous Traumatic Stress: A Systematic Review of Studies Among Adults Living in Southern Israel**

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# Psychopathology, Risk, and Resilience Under Exposure to Continuous Traumatic Stress: A Systematic Review of Studies Among Adults Living in Southern Israel

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Countless people around the world live with exposure to continuous traumatic stress (CTS) as a result of violent political conflict. Over the past 15 years, residents of southern Israel have been exposed to rocket fire from Gaza with varying intensity, and their mental health has been the subject of many studies. The purpose of this article was to systematically review the empirical literature on psychopathology in the southern Israel adult population exposed to CTS, focusing on their symptomatic picture, prevalence rates, and risk and protective factors. Twenty-eight quantitative articles were identified for review. The reviewed studies reported high levels of probable posttraumatic stress disorder, depression, and other psychopathological reactions among the CTS population during low-intensity periods, which appear to rise sharply during escalations. This review identified high-risk groups based on community of residence, level of exposure, socioeconomic factors, and perceived social support. This review proposes that future studies use intensive, longitudinal methods to elucidate the effect of changing exposure intensity, and that interventions target the identified vulnerable groups, with a focus on intrapersonal, social, and community protective factors highlighted in the review.

*Keywords:* ongoing exposure to trauma, PTSD, depression, war, conflict

Exposure to continuous traumatic stress (CTS; Straker, 1987), also known as ongoing exposure to trauma (Braun-Lewensohn, Celestin-Westreich, Celestin, Verté, & Ponjaert-Kristoffersen, 2009) or Type III trauma exposure (Kira et al., 2013), refers to situations in which individuals repeatedly face traumatic events in their everyday lives for prolonged periods. These situations may result from ongoing violent political conflict and, unfortunately, are currently the experience of numerous populations around the world. It has been argued that the psychological impact of current

CTS is likely to differ from that of isolated traumatic events (Type I exposure), or of repeated interpersonal traumas (Type II exposure), as CTS involves a current ongoing threat, whereas Type I and Type II traumas refer to events that have occurred in the past and have since ceased (Diamond, Lipsitz, Fajerman, & Rozenblat, 2010; Lahad & Leykin, 2010; Nuttman-Shwartz & Shoval-Zuckerman, 2015). Yet, despite these differences, distress reactions to all three types of traumatic exposure have largely been categorized in relation to symptoms of posttraumatic stress disorder (PTSD).

Recently, it has been argued by a number of researchers that the PTSD paradigm may not be the most appropriate way of characterizing CTS responses (Diamond et al., 2010; Lahad & Leykin, 2010; Nuttman-Shwartz & Shoval-Zuckerman, 2015; Stein, Wilmot, & Solomon, 2016). For example, Diamond et al. (2010) noted that in CTS contexts, symptoms may abate when individuals leave the area of potential exposure, suggesting that this is a transient state. Second, although trauma exposure is ongoing, PTSD may not “fit,” as avoidance of the situation is impossible, while arousal symptoms may be adaptive in this context (Diamond, Lipsitz, & Hoffman, 2013). It may be that other outcomes, such as depression, anxiety symptoms, or sleep difficulties, are better markers of distress in CTS contexts, or at least can give a more comprehensive picture of the psychopathological impact of this kind of exposure.

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The current study aims to review the empirical literature on a particular group with CTS exposure—Israeli civilians with ongoing exposure to rocket fire. Since 2001, more than 15,000 rockets and mortars have been indiscriminately fired into Israel (Israel Ministry of Foreign Affairs, 2014). These attacks have caused deaths, injuries, damage, and disruption to everyday life. The range of these rockets has gradually increased from 10 km (2001–2004) to 160 km (since 2014), threatening close to 70% of the Israeli population (Israel Ministry of Foreign Affairs, 2014), although only residents who live in the first 40 km have had continuous exposure.

An excellent review on the psychological aspects of the Israeli–Palestinian conflict highlighted the toll that the conflict has had on citizens on both sides of the border (Ayer et al., 2015). Studies indicate that PTSD and depression are extremely prevalent among Palestinian civilians who have a high degree of exposure to political violence, compounded by poverty and a sense of uncertainty over the future (Canetti et al., 2010). Israeli civilians have been found to have lower rates of distress compared with Palestinians (Lavi, Canetti, Sharvit, Bar-Tal, & Hobfoll, 2014), perhaps buffered by a relatively stable social context, low levels of extreme poverty, a high degree of access to resources and therapy, and in more recent years, the construction of bomb shelters and missile defense systems that provide protection from rockets. The review by Ayer et al. (2015) emphasized the importance of investigating the impact of exposure to the conflict beyond PTSD, as well as reporting on associations between level of exposure and psychological distress. However, the review did not differentiate between these populations, who are obviously suffering from different types of exposure. Specifically focusing on one of these groups suffering from CTS exposure could clarify some of the variability between studies.

A case study of CTS exposure among Israeli civilians provides an opportunity for a valuable and meaningful literature review. First, as this situation has been well-studied over 15 years, it provides an opportunity to investigate what happens to such populations over time. In general, only longitudinal studies can reveal this kind of information; however, an examination of multiple cross-sectional studies conducted among the same population at different time points may also provide similar information. This review also provides a unique opportunity to understand psychopathology in the context of ongoing trauma; in many CTS contexts, the situation is too unsafe for trauma researchers to enter, or the situation is so difficult that conducting research is not feasible.

The current review examines existing empirical evidence on clinical reactions to CTS on people living in southern Israel to clarify the potential mental health implications, investigate risk and protective factors, and examine limitations of existing studies. Specifically, the aim of this review is to answer two main questions: (a) What is the psychopathological picture of CTS responses? and (b) What are the risk and protective factors for psychopathology in this population?

## Method

We conducted a systematic search for studies published in English (searches were conducted on February 1, 2016) in PsycNET and Google Scholar. We used the following search term categories: *Israel AND Missile*, *Israel AND Rocket*, *Israel AND*

*Continuous Exposure*, and *Israel AND Ongoing Exposure*. We excluded studies that examined the Palestinian population, as this exposure is different in terms of type, duration, and severity of exposure. Papers were selected for initial review based on the following criteria: (a) published in English, (b) peer reviewed, (c) quantitative research, and (d) published between the years 2000 and 2016. We then checked the reference lists in the bibliographies of studies returned in the search, as well as forward citation tracking of all the selected papers.

This search yielded 184 articles, from which we removed 28 duplicate articles following an initial screening check, leaving 156 unique articles (see Figure 1). We then added additional inclusion criteria: (e) assessed Israelis with primary ongoing exposure to rocket fire from Gaza, (f) assessed a solely adult sample, and (g) measured psychopathological reactions. Of the 156 articles selected for review, 96 articles were excluded because they assessed populations exposed to other conflicts or terror situations, or assessed populations who were only exposed to rocket fire during escalations, and therefore did not have ongoing exposure. Twenty-four articles were excluded because their samples included children or adolescents. The other articles not meeting the criteria for inclusion were one study of adults with intellectual disability, one study investigating secondary traumatization among social workers, and six articles that assessed nonpsychopathological emotional reactions. This left 28 articles for review (see Table 1).

## Results

The earliest point of data collection was in 2005, and the last point of data collection was August 2014 (during Operation Protective Edge). The 28 identified articles reported on 33 studies, of which 32 met inclusion criteria. Twenty-five studies used a cross-sectional design, whereas only seven used a longitudinal design. Of the 32 studies reviewed only 14 included a non-CTS comparison group. Sampling methods varied, with 14 studies using different randomized methods, 11 studies using convenience sampling, and six studies using snowball sampling.

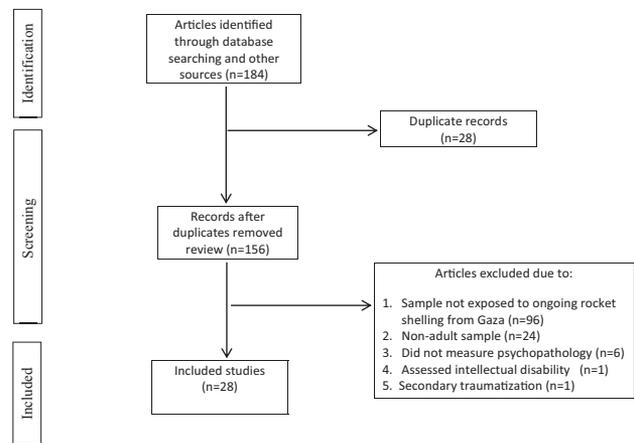


Figure 1. Flow diagram for identification, screening, and inclusion of studies.

**Table 1**  
*Empirical Studies Assessing Psychopathology, Risk Factors, and Protective Factors in the Adult Population in Southern Israel Exposed to Continuous Traumatic Stress (CTS)*

Publication	Study and sample design	Data collection date	Participants	Exposure measures	Psychopathology measures	Psychopathology rates	Key risk and protective factors	Strengths	Limitations
1. Ben-Ezra, Palgi, Hamama-Raz, and Shiria (2015) Study 1: T1 (n = 194) T2 (n = 138)	Longitudinal	December 2008–January 2009	Sderot and surrounding communities	All those included in the study were considered exposed (participants living continuously in the area since 2001)	General health questionnaire Acute Stress Disorder scale (ASD) Short Center for Epidemiological Studies Depression scale (Short CES-D) PTSD checklist	At T1: ASD, 12% Depressive symptoms, 35.2% Psychological distress, 58.9% At T2: PTSD, 13%	Risk: ASD at T1 increased the risk for PTSD at T2 by more than seven times Perceived self-responsibility (for personal reaction) at T1 was positively associated with PTSD at T2	Longitudinal study design	PTSD was not assessed at T1
	Random digit dialing	June 2009 (6 months after ceasefire)							
Study 2: T1 (n = 26) T2 (n = 26)	Longitudinal	April 2011	Sderot and surrounding communities	All those included in the study were considered exposed (participants living continuously in the area since 2001)	General health questionnaire ASD Short CES-D PTSD checklist	At T1: ASD, 10.57% At T2: PTSD, 7.3%	Risk: ASD symptoms at T1 significantly predicted PTSD at T2	—	Small sample size and convenience sampling
	Convenience sampling	(immediately after an escalation) July 2011 (3 months after the escalation)							
2. Ben-Ezra, Palgi, Shiria, and Hamama-Raz (2013) Study 1: Study group (n = 46) Control group (n = 41)	Cross-sectional	January 2009	Study group: Nurses working within rocket range (Ashkelon) Control group: Nurses working outside of rocket range (Tel Aviv)	All those working within rocket range were considered exposed	Impact of Event Scale–Revised (IES-R for PTSD) CES-D Psychosomatic Problems Scale	Not assessed	Risk: The exposed group had higher PTSD, depressive, and psychosomatic symptoms Both exposed groups had higher PTSD compared with the unexposed groups Nurses in the exposed group in Study 1 had higher depressive and psychosomatic symptoms than the nurses in the previously exposed group in Study 2	Comparison group	Cross-sectional Small sample size
	Randomized sampling	Lead							

(table continues)

Table 1 (continued)

Publication	Study and sample design	Data collection date	Participants	Exposure measures	Psychopathology measures	Psychopathology rates	Key risk and protective factors	Strengths	Limitations
Study 2: Study group ( <i>n</i> = 45) Control group ( <i>n</i> = 31)	Cross-sectional Randomized sampling	July 2009 (6 months after ceasefire)	Study group: Nurses within rocket range (Ashkelon)  Control group: Nurses working outside of rocket range (Tel Aviv)	All those working within rocket range were considered previously exposed	IES-R CES-D Psychosomatic Problems Scale	Not assessed	Protective: The previously exposed group had lower psychosomatic symptoms than the unexposed group	Comparison group	Cross-sectional design  Small sample size
3. Besser and Neria (2009) Study group ( <i>n</i> = 160) Control group ( <i>n</i> = 181)	Cross-sectional Stratified randomized sampling	October 2007– April 2008	Study group: Sderot and surrounding communities within rocket range  Control group: Eilat and surrounding communities	All those living in and around Sderot were considered exposed communities All those living in and around Eilat were considered unexposed	IES-R (PTSD)	Study group: Elevated levels of PTSD symptoms—27% Control group: Elevated level of PTSD symptoms— 3%	Risk: Gender (female) was associated with PTSD In the exposed group, PTSD symptoms were positively associated with more prejudiced attitudes Protective: In the exposed group, life satisfaction was negatively associated with PTSD severity	Comparison group	Cross-sectional design
4. Besser and Neria (2010) T1 ( <i>n</i> = 135) T2 ( <i>n</i> = 133)	Longitudinal Convenience sampling	January 2009 (during Operation Cast Lead) May 2009 (4 months after ceasefire)	Students at Sapir College (Sderot)	Proximity to border, with three groups identified (all within rocket range) (1) 0–20 km from the border (2) 20–30 km from the border (3) 30–40 km from the border	PTSD Inventory (PTSD-I) Patient Health Questionnaire-9 (PHQ- 9 for depression symptoms)	Not assessed	Risk: Higher attachment anxiety was positively associated with more PTSD and depression symptoms at the same time point and longitudinally Higher attachment anxiety at T1 was associated with greater PTSD and depression symptoms at T2 Protective: Social support was negatively correlated with both PTSD and depression symptoms at the same time point and longitudinally	Longitudinal design	Convenience sampling

(table continues)

Table 1 (continued)

Publication	Study and sample design	Data collection date	Participants	Exposure measures	Psychopathology measures	Psychopathology rates	Key risk and protective factors	Strengths	Limitations
5. Besser and Neria (2012) (n = 135)	Cross-sectional Convenience sampling	January 2009 (during Operation Cast Lead)	Students at a college in Sderot, who were evacuated to their families (still within rocket range)	Proximity to border, with three groups identified (all within rocket range) (1) 11–20 km from the border (2) 21–30 km from the border (3) 31–40 km from the border	PTSD-I	Probable PTSD—20%	Risk: Low levels of social support mediated the association of attachment and PTSD Intensity of exposure (proximity to the border) was not related to PTSD symptoms	—	Cross-sectional design Convenience sampling
6. Besser, Neria, and Haynes (2009) Study group (n = 254) Control group (n = 308)	Cross-sectional Stratified randomized sampling	October 2007–April 2008	Study group: Sderot and surrounding communities within rocket range Control group: Eilat and surrounding communities	All those living in and around Sderot were considered exposed All those living in and around Eilat were considered unexposed	Stress Arousal Checklist (SACL; psychological experience) IES-R (PTSD)	Not assessed	Risk: Exposure was associated with higher levels of PTSD, and perceived stress Gender (female) and low education levels were associated with greater levels of PTSD Link between perceived stress and PTSD symptoms was significantly stronger in the exposed group Higher levels of perceived stress in the exposed group mediated the association between attachment anxiety and PTSD	Comparison group Large and matched sample	Cross-sectional design
7. Besser and Priel (2010) Study 1: Study group (n = 129) Control group (n = 155)	Cross-sectional Stratified randomized sampling	October 2007–April 2008	Study group: Sderot and surrounding communities within rocket range Control group: Eilat and surrounding communities	All those living in and around Sderot were considered exposed All those living in and around Eilat were considered unexposed <sup>a</sup>	IES-R (PTSD) SACL The Depressive Experience Questionnaire (DEQ)	Not assessed	Risk: Exposure was positively associated with dependency, PTSD severity, and perceived stress Among the exposed group, level of stress was associated with PTSD severity, as well as higher levels of dependency For the unexposed group only self-criticism was related to levels of PTSD	Comparison group	Cross-sectional design

(table continues)

Table 1 (continued)

Publication	Study and sample design	Data collection date	Participants	Exposure measures	Psychopathology measures	Psychopathology rates	Key risk and protective factors	Strengths	Limitations
Study 2: Study group ( <i>n</i> = 119) Control group ( <i>n</i> = 127)	Cross-sectional Stratified randomized sampling	October 2007– April 2008	Study group: Sderot and surrounding communities within rocket range Control group: Eilat and surrounding communities	All those living in and around Sderot were considered exposed All those living in and around Eilat were considered unexposed	IES-R SACL DEQ Visual Analog Scale (negative affect scales for negative state mood) State Anger Scale Somatic, Cognitive and Behavioral Anxiety Inventory—Somatic subscale	Not assessed	<b>Risk:</b> Exposure was associated with higher levels of dysphoria, anxiety, hostility, anger, and somatization, compared with the nonexposed group Levels of stress and arousal, as well as dependency were associated with higher levels of PTSD Among the exposed group, the associations between dependency and PTSD severity and overall distress were mediated by low levels of perceived social support and maladaptive emotional regulation Among the unexposed group the associations between self-criticism and PTSD severity were mediated by maladaptive emotional regulation	Comparison group	Cross-sectional design
8. Besser, Weinberg, Zeigler-Hill, and Neria (2014) ( <i>n</i> = 140)	Cross-sectional Snowball	November 2012 (during Operation Pillar of Defense)	Women in rocket fire range	All those included in the study were considered exposed (all participants lived 7–40 km from the border with Gaza)	PTSD Checklist civilians (PCL-C) The Dissociative Experience Scale	Not assessed	<b>Protective:</b> Both intrapersonal (hope, optimism, and self-esteem) and interpersonal (perceived social support) sources of resilience were negatively associated with PTSD and dissociative symptoms	—	Cross-sectional design
9. Besser, Zeigler-Hill, Pincus, and Neria (2013) ( <i>n</i> = 342)	Cross-sectional Snowball	November 2012 (during Operation Pillar of Defense)	Women in rocket fire range	Three levels of exposure severity were identified according to exposure during the operation: (1) High exposure, 7–40 km from the border (CTS group) (2) Moderate exposure severity, 65–75 km (3) Low exposure, 50–60 km	The Pathological Narcissism Inventory PCL-C Generalized Anxiety Disorder Scale (GAD-7)	Not assessed	<b>Risk:</b> High exposure severity (CTS) had significantly higher PTSD and GAD (there was no difference between the moderate and low exposure groups) PTSD and GAD symptoms were related to pathological narcissism for those who were highly and moderately exposed during the operation (the CTS and not CTS—moderately exposed group)	Large sample size	Cross-sectional Comparison group

(table continues)

Table 1 (continued)

Publication	Study and sample design	Data collection date	Participants	Exposure measures	Psychopathology measures	Psychopathology rates	Key risk and protective factors	Strengths	Limitations
10. Besser, Zeigler-Hill, Weinberg, Pincus, and Neria (2015) (n = 251)	Cross-sectional Snowball	July–August 2014 (during Operation Protective Edge)	Jewish Israeli adults living in communities exposed to rocket fire	Sample was divided into three groups according to exposure during the operation (1) High exposure, 7–40 km from border (CTS group) (2) Moderate exposure, 65–75 km (3) Low exposure, 50–60 km	PCL-C	Not assessed	Risk: Moderate and high exposure (CTS) groups had higher PTSD symptom levels than the low exposure group; there were no significant differences between them <sup>b</sup>	—	Cross-sectional
11. Braun-Lewensohn and Rubín (2014) (n = 843)	Cross-sectional Not stated	March–April 2012 (1 week to 1 month after an escalation)	Adults living within rocket fire range	Sample was divided into three groups based on distance from border with Gaza (1) Up to 7 km from border (CTS group) (2) 7–40 km from border (CTS group) (3) More than 40 km from border	Psychological distress (SPD)	Not assessed	Risk: The medium proximity group reported the highest distress Women had higher levels of distress (above and beyond group) Protective: Middle-aged population had the least distress (above and beyond group) High family income was negatively associated with distress (above and beyond group) Sense of coherence was negatively associated with distress, especially in the CTS group closest to the border	Large sample size	Cross-sectional The duration of exposure (CTS vs. short-term exposure) was not regarded as a factor in most of the analyses

(table continues)

Table 1 (continued)

Publication	Study and sample design	Data collection date	Participants	Exposure measures	Psychopathology measures	Psychopathology rates	Key risk and protective factors	Strengths	Limitations
12. Chipman, Palmieri, Canetti, Johnson, and Hobfoll (2011) Study group ( <i>n</i> = 500) Control group ( <i>n</i> = 501)	Cross-sectional Random telephone sampling, stratified for gender and exposure	July–August 2008	Study group: Residents of exposed regions (Sderot, Netivot, or Ashkelon) Control group: Residents of low or nonexposed regions were present when there (Ofakim, Ashdod, or Akiva)	Exposure group was based on place of residence Direct exposure was also assessed by three items asking how many times participants had experienced the following due to rocket attacks: (1) Witnessed or were present when there were injuries or fatalities (2) A family member or close friend died (3) Personally injured or had a family member or friend who was injured	PTSD Symptom Scale	Posttraumatic stress- related impairment—29% Probable PTSD—5.5%	Risk: High-exposure region had higher levels of posttraumatic stress-related impairment (exposure region was only a marginally significant predictor after accounting for other exposure variables) Injury to oneself, a close friend, or family member predicted impairment (above and beyond group) Gender (female), less education, and low income, as well as the loss of psychological resources, worse health, and sleep disturbance were significantly associated with greater impairment (above and beyond group)	Large sample size Comparison group	Cross-sectional The duration of exposure (CTS vs. short-term exposure) was not regarded as a factor in most of the analyses
13. Dekel and Nuttman- Shwartz (2009) Study group 1 ( <i>n</i> = 67) Study group 2 ( <i>n</i> = 67)	Cross-sectional Convenience, matched for gender and age	March–July 2005	Study group: Urban residents with lower education and higher exposure (Sderot) Control group: Kibbutz residents with higher education and lower exposure (Kibbutz)	Participants were asked to indicate their direct exposure to rockets on a 5-point scale ranging from 1 ( <i>no direct exposure</i> ) to 5 ( <i>a rocket fell on or very close to my home</i> )	PTSD-I	Not assessed	Risk: Higher exposure was associated with greater PTSD level Urban residents/lower education reported greater levels of posttraumatic symptoms (even after controlling for greater exposure of the group) Older age was associated with greater PTSD PTSD and PTG were significantly associated High levels of threat appraisal were associated with greater levels of PTSD Protective: Sense of belonging was a significant protective factor for PTSD for the kibbutz residents	Comparison group	Cross-sectional Convenience sampling

(table continues)

Table 1 (continued)

Publication	Study and sample design	Data collection date	Participants	Exposure measures	Psychopathology measures	Psychopathology rates	Key risk and protective factors	Strengths	Limitations
14. Dickstein et al. (2012) (n = 450)	Cross-sectional Stratified	August 2009	Residents of Sderot and Ofet Aza (all in range of fire)	Exposure was measured using a 6-item questionnaire relating to personal injury, family member injury, close friend injury, family member killed, close friend killed, and loss of property	PCL Depression Anxiety Stress Scale 21	Not assessed	Risk: Exposure was positively correlated with PTSD, depression, anxiety, and stress symptoms Under substance use coping, denial/disengagement, and social support seeking; terror-related exposure was associated with higher depression, anxiety, and stress Protective: Acceptance/positive reframing was associated with decreased levels of PTSD, depression, anxiety, and stress	Large sample size	Cross-sectional
15. Finklestein, Stein, Greene, Bronstein, and Solomon (2015) Study group (n = 50) Control group (n = 49)	Cross-sectional Convenience sampling	February–September 2009	Study group: Mental health professionals working in Sderot Control group: Mental health professionals working in rural communities bordering Gaza	All participants work in exposure region Objective exposure was assessed by 10 items related to the frequency of direct exposure to rocket fire Subjective exposure was assessed by four items that reflected perceived threat (e.g., personal and family security) Professional exposure was assessed by six items related to the frequency of exposure through work <sup>c</sup>	PTSD-I Modified version of the Compassion Fatigue Questionnaire (for vicarious trauma)	Not assessed	Risk: Study group (higher objective, subjective, and professional exposure to rockets compared with the controls) reported higher PTSD and vicarious traumatization symptoms Subjective exposure predicted both PTSD and vicarious traumatization PTSD was predicted by professional experience and perceived professional competence Vicarious traumatization was predicted by years of education Vicarious traumatization was predicted by professional experience, professional support, and perceived professional competence		Cross-sectional Convenience sampling

(table continues)

Table 1 (continued)

Publication	Study and sample design	Data collection date	Participants	Exposure measures	Psychopathology measures	Psychopathology rates	Key risk and protective factors	Strengths	Limitations
16. Gelkopf, Berger, Bleich, and Silver (2012) Study groups Urban ( <i>n</i> = 285) Rural ( <i>n</i> = 102) Control groups Urban ( <i>n</i> = 251) Rural ( <i>n</i> = 102)	Cross-sectional Random-digit dialing	July 2007	Study groups: High-exposure urban and high-exposure rural (Ofet/Aza) Control groups: Low-exposure urban and low-exposure rural (Hevel/Lachish)	Sderot and Ofet/Gaza residents were considered highly exposed Ofakim and Hevel/Lakish were considered "indirectly" exposed Objective exposure to rocket fire was assessed using questions relating to personal exposure, near missile, and injury/loss of close other	PCL 18-Item Brief Symptom Inventory	Probable PTSD: High/urban group—26.4% High/rural—5.6% Low/urban—1.5% Low/rural—0%	Risk: High exposure/urban group reported higher PTSD and distress, and worse functioning than the other three groups High exposure/rural residents reported more anxiety and distress than residents of low/rural A life history of traumas was related to greater PTSD (above and beyond group)  Protective: Social support and optimism were negatively associated with PTSD (above and beyond group)	Comparison group	Cross-sectional
17. Gil, Weinberg, Or-Chen, and Harel (2015) ( <i>n</i> = 501)	Cross-sectional Snowball	July 2014 (during Operation Protective Edge)	Residents living within the range of rocket fire during the war	Three levels of objective threat were defined: 1) High exposure, 7–40 km from border (CTS group) 2) Moderate exposure, 40–80 km 3) Low exposure, over 80 km Subjective threat was examined by a single question on a 4-point Likert scale relating to the participant's estimation of the threat that missiles will harm his/her living space	DSM-5 PTSD Symptom Levels Scale Peritraumatic Dissociative Experiences Questionnaire	Not assessed	Risk: High levels of objective and subjective threat were positively associated with distress Higher peritraumatic dissociation was associated with higher PTSD symptoms (above and beyond CTS) Females were at higher risk for PTSD symptoms (above and beyond CTS)  Protective: Higher tendency to forgive was associated with fewer PTSD symptoms (above and beyond CTS)	Comparison groups	Cross-sectional CTS was not taken into consideration in part of the analyses

(table continues)

Table 1 (continued)

Publication	Study and sample design	Data collection date	Participants	Exposure measures	Psychopathology measures	Psychopathology rates	Key risk and protective factors	Strengths	Limitations
18. Cili et al. (2016) T1 (n = 212) T2 (n = 160)	Longitudinal Snowball	July 2014 (during Operation Protective Edge) August 2014 (during a ceasefire during Operation Protective Edge)	Residents living within the range of rocket fire during the war	Three levels of objective threat were defined: (1) High exposure, 7–40 km from border (CTS group) (2) Moderate exposure, 40–80 km (3) Low exposure, over 80 km	DSM-5 PTSD Symptom Levels Scale Peritraumatic Dissociative Experiences Questionnaire	Not assessed	Risk: Higher PTSD symptoms at T1 were associated with higher PTSD symptoms at T2 (above and beyond CTS) Higher PTSD symptoms at T1 were associated with higher dissociation symptoms at T2 (above and beyond CTS) Higher dissociation symptoms at T2 were associated with higher PTSD symptoms at T2 (above and beyond CTS) Protective: Higher peritraumatic dissociation at T1 was associated with lower PTSD symptoms at T2 (above and beyond CTS) <sup>d</sup>	Longitudinal Comparison group	—
19. Lassar, Soffer-Dudek, Lerman, Rudich, and Shahar (2013) <sup>1</sup> Study 1 T1 (n = 91) T2 (n = 67)	Longitudinal Convenience sampling	Approximately 1 year before Operation Cast Lead (precise dates not given, likely in 2008) January–February 2009 (1–2 months after Operation Cast Lead)	Undergraduates studying at a college exposed to rocket attacks	Questionnaire which assessed four types of exposure: (1) Perceived stress-related exposure (2) Physical exposure (how close and how loud the missiles were from their location?) (3) Relational exposure (were people they knew affected by the missiles?) (4) Media exposure (the amount of terror-related television they watched following the attacks and their emotional reactions to it)	53-Item Brief Symptom Inventory (BSI-53) DEQ	Not assessed	Risk: Only under high perceived stress-related exposure Self-criticism positively predicted increased levels of postexposure psychopathology	Longitudinal	Convenience sampling

(table continues)

Table 1 (continued)

Publication	Study and sample design	Data collection date	Participants	Exposure measures	Psychopathology measures	Psychopathology rates	Key risk and protective factors	Strengths	Limitations
Study 2 T1 ( <i>n</i> = 273) T2 ( <i>n</i> = 214) T3 ( <i>n</i> = 78)	Longitudinal Convenience sampling	Approximately 3 years before Operation Cast Lead (precise dates not given, likely in 2006) 3 months later January 2009 (1 week after Operation Cast Lead)	Graduates of a college exposed to rocket attacks	Questionnaire which assessed four types of exposure: (1) Perceived stress-related exposure (2) Physical exposure (how close and how loud the missiles were from their location?) (3) Relational exposure (were people they knew affected by the missiles?) (4) Media exposure (the amount of terror-related television they watched following the attacks and their emotional reactions to it)	BSI-53 DEQ-SC6 (Self-Criticism Scale)	Not assessed	Risk: Only under high perceived stress-related exposure: When initial levels of preexposure psychopathology were low, self-criticism predicted elevated levels of postexposure psychopathology Only under low media exposure: When initial levels of preexposure psychopathology were low, self-criticism predicted increased levels of postexposure psychopathology When initial levels of preexposure psychopathology were high, self-criticism predicted decreased levels of postexposure psychopathology Protective: When initial levels of preexposure psychopathology were high, self-criticism predicted decreased levels of postexposure psychopathology	Longitudinal	Convenience sampling
20. Neria, Besser, Kiper, and Westphal (2010) T1 ( <i>n</i> = 135) T2 ( <i>n</i> = 134) T3 ( <i>n</i> = 133)	Longitudinal Convenience sampling	7 January 2009 (during Operation Cast Lead) 10 March 2009 (2 months after Operation Cast Lead) 8 May 2009 (4 months after Operation Cast Lead)	Students at a college in Sderot	Severity of exposure to rocket and missile attacks before and during the war was assessed by asking each participant about the number of times he or she was exposed to attacks before and during the war Even after evacuation to their parents' homes, most students remained in rocket fire range	PTSD-I PHQ-9 for depression GAD-7	PTSD prevalence: T1 = 20% T2 = 3.0% T3 = 2.2% Depression prevalence: T1 = 45.2% T2 = 22.2% T3 = 22.2% GAD prevalence: T1 = 57.8% T2 = 21.5% T3 = 12.6%	Risk: Females reported higher distress Immediate emotional response predicted PTSD, depression, and GAD, over time Protective: High levels of perceived social support predicted lower levels of psychopathology over time High perceived social support moderated the effects of emotional response on distress <sup>a</sup>	Longitudinal Data collection in varied level of exposure periods	Convenience sampling

(table continues)

Table 1 (continued)

Publication	Study and sample design	Data collection date	Participants	Exposure measures	Psychopathology measures	Psychopathology rates	Key risk and protective factors	Strengths	Limitations
21. Nuttman-Shwartz (2014) (n = 451)	Cross-sectional Convenience sampling	Not stated	Students at a community college in rocket firing range	Students were asked whether they had been exposed to rockets, and if so, at what proximity on a 4-point scale	BSI-53 (general score) Functioning was measured using 12 statements that tap various aspects of daily functioning	Not assessed	Risk: High levels of exposure was associated with lower levels of functioning Married participants had higher levels of general stress reactions Women reported higher levels of general stress reactions Fear reactions mediated between levels of exposure to rockets and both general stress reactions and impaired functioning Fear reactions also mediated between distractive coping styles and both general stress reactions and impaired functioning	Large sample size	Cross-sectional Convenience sampling
22. Nuttman-Shwartz and Dekel (2009) Total (n = 500) Sderot residents (n = 69) Rural settlements (n = 73) Communities outside of confrontation zone (n = 358)	Cross-sectional Convenience but includes oversampling participants from higher exposed areas	Not stated	Students of Sapir College in Sderot (within rocket range)	Participants were divided into three groups based on place of residence Exposure was assessed by a single question in which participants were asked if they had ever been exposed to rockets	PTSD-I	Probable PTSD: Overall—9.5% Sderot group—26% Rural group—6% Other areas—6%	Risk: Living in Sderot and high level of exposure were both associated with higher levels of PTSD symptoms Sderot residents had significantly higher alcohol use Low economic status and being female were both associated with higher levels of PTSD (above and beyond groups) High levels of alcohol and medication use, and higher levels of support seeking were both associated with higher levels of PTSD (above and beyond groups) Protective: High sense of belonging to the community and use of acceptance as a way of coping were both associated with low levels of PTSD (above and beyond groups)	Comparison group	Cross-sectional Convenience sampling Risk and resilient factors were analyzed above and beyond CTS (although between group differences in PTSD were found)

(table continues)

Table 1 (continued)

Publication	Study and sample design	Data collection date	Participants	Exposure measures	Psychopathology measures	Psychopathology rates	Key risk and protective factors	Strengths	Limitations
23. Nuttman-Shwartz, Dekel, and Regev (2015) Urban group ( <i>n</i> = 140) Rural group ( <i>n</i> = 136)	Cross sectional Convenience was used for young adult participants Older participants were sampled from lists of residents of the region. Strategy was not described	2007–2009 (includes both escalations and periods of relative calm)	Two age- groups of exposed adults from urban and rural regions	Exposure was assessed using the exposure to attacks questionnaire (five items) mean score	PTSD-I	Probable PTSD: Urban group: Younger (aged 20– 30) = 29.5% Older (aged 60–75) = 40.5% Rural group: Younger = 4.5% Older = 7.1%	Risk: Exposure was positively correlated with PTSD symptoms Urban residents reported higher PTSD rates Low income predicted higher PTSD Protective: Higher sense of belonging to the community predicted lower PTSD symptoms Risk: The following were associated with probable PTSD: Exposure to rockets Lower education Religiosity Low self-rated health Incidence of depression	—	Cross-sectional Convenience sampling
24. Palgi (2015) ( <i>n</i> = 339)	Cross sectional In-region random digit dialing methodology	January– February 2014	Jewish, older than 50, living in communities surrounding Gaza	Exposure was assessed by the number of exposures reported from communities surrounding an eight-item list I heard or saw a rocket fall, a rocket fell close to me, my house was hit, I was physically injured, someone I know was physically injured, a family member or a close relative was physically injured, one of my acquaintances was killed, and a family member or a close relative was killed	PTSD checklist adapted for DSM-5	Probable PTSD—24.8% Intrusions—52.5% Avoidance—43.7% Negative mood and cognitions—45.4% Arousal—48.4%	Risk: Older men who reported low exposure to traumatic life events (before the security situation) had significantly higher PTSD symptoms	Random sampling	Cross-sectional
25. Palgi, Gelkopf, and Berger (2015) ( <i>n</i> = 343)	Cross sectional In-region random digit dialing methodology	July 2007	Highly exposed city of Sderot as well as rural communities bordering Gaza	Exposure was assessed by number of exposures reported from an eight-item list (see Palgi, Gelkopf, & Berger)	PCL	Not assessed	Risk: Older men who reported low exposure to traumatic life events (before the security situation) had significantly higher PTSD symptoms	Random sampling	Cross-sectional

(table continues)

Table 1 (continued)

Publication	Study and sample design	Data collection date	Participants	Exposure measures	Psychopathology measures	Psychopathology rates	Key risk and protective factors	Strengths	Limitations
26. Palmieri, Chipman, Canetti, Johnson, and Hobfoll (2010) Study group (n = 500) Control group (n = 501)	Cross-sectional Random telephone sampling, stratified for gender and exposure	July–August 2008	Study group: Residents of exposed regions (Sderot, Netivot, or Ashkelon) Control group: Residents of low or nonexposed region (Ofakim, Ashdod, or Akiva)	The sample was split into a high exposure group and a low exposure group based on place of living Direct exposure was also assessed by three items asking how many times participants had experienced: death of a family member or close friend as a result of rocket or terror attacks; an injury to oneself, a family member, or close friend as a result of rocket or terror attacks; and witnessing rocket or terror attacks, or being present where there were injuries or fatalities	PTSD Symptom Scale PHQ-9	Probable PTSD: Study group—5.6% Control group—5.4% Probable depression: Study group—6% Control group—5.6% Sleep problems: (in both groups)—37.4%	Risk: Gender (female), older age, and economic loss were associated with more sleep problems (above and beyond group) Psychosocial resource loss was associated with sleep problems (above and beyond group) Probable PTSD was associated with sleep problems (above and beyond group) <sup>f</sup>	Comparison group Random sampling Large sample size	Cross-sectional

(table continues)

Table 1 (continued)

Publication	Study and sample design	Data collection date	Participants	Exposure measures	Psychopathology measures	Psychopathology rates	Key risk and protective factors	Strengths	Limitations
27. Stein et al. (2013) Urban group ( <i>n</i> = 298) Rural group ( <i>n</i> = 152)	Cross-sectional Random telephone sampling Stratified	August 2009	High exposure urban (Sderot) High exposure rural (Otef Aza)	Exposure was assessed by an 11-item (yes/no) measure that asked participants whether they, their family member, or close friend had been exposed to a terrorist attack. Participants were then asked to indicate whether they or their family member or close friend had been injured in an attack, whether they or their family member or close friend lost property in an attack, and whether a family member or close friend was killed in an attack	PCI-C Depression Anxiety Stress Scale 21	Probable PTSD: Urban—55.2% Rural—6.6%	Risk: Sderot group: Level of terror-related exposure strongly predicted PTSD Low level of education was a significant predictor for depression Number of categories of life traumas strongly predicted PTSD and depression Otef Gaza group: Age, income, and being single were significant predictors of depression	Random sampling	Cross-sectional
28. Weinberg, Besser, Zeigler-Hill, and Neria (2015) ( <i>n</i> = 140)	Cross-sectional	November 2012 (during Operation Pillar of Defense)	Female civilians living in southwest Israel 7–40 km from the border with Gaza	All participants were in rocket range and were considered exposed	GAD-7 The Dissociative Experience Scale	Not assessed	Risk: Acute GAD symptoms and dissociative experiences were positively correlated Protective: Self-esteem mediated the association between optimism and acute GAD symptoms Self-esteem was negatively associated with acute GAD symptoms Dispositional optimism was negatively associated with acute GAD symptoms and dissociative experiences	—	Cross-sectional design

*Note.* PTSD = posttraumatic stress disorder; SPD = serious psychological distress; PTG = posttraumatic growth; DSM-5 = *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*.  
<sup>a</sup> It was noted that they were indirectly exposed through the media. <sup>b</sup> PTSD symptoms did not significantly differ between a CTS group and a non-CTS group that was exposed to shelling during an operation; however, both groups significantly differ from a non-CTS low exposure group. <sup>c</sup> These measures were created for the purpose of this study. <sup>d</sup> Proximity to the border was not significantly associated with PTSD symptoms at T2. <sup>e</sup> Severity of exposure was not associated with distress. <sup>f</sup> Exposure was not significantly associated with PTSD, depression, or sleep problems.

## Psychopathology Prevalence

**Probable PTSD prevalence.** Of the reviewed articles, 11 articles (12 studies) reported probable PTSD prevalence rates in CTS populations. Nine cross-sectional studies assessed rates during “routine” times (i.e., between escalations, with less intense rocket fire), with probable PTSD rates ranging from 5.6% to 35.2% (Ben-Ezra, Palgi, Hamama-Raz, & Shrira, 2015; Besser & Neria, 2009; Chipman, Palmieri, Canetti, Johnson, & Hobfoll, 2011; Gelkopf, Berger, Bleich, & Silver, 2012; Nuttman-Shwartz & Dekel, 2009; Nuttman-Shwartz, Dekel, & Regev, 2015; Palgi, Gelkopf, & Berger, 2015; Palmieri, Chipman, Canetti, Johnson, & Hobfoll, 2010; Stein et al., 2013). These differences seem to stem from various risk factors such as current exposure, overall exposure level, low socioeconomic status (SES), and community structure, as will be discussed later. One cross-sectional study assessed rates during an escalation, reporting a probable PTSD rate of 20% among students from a higher education college near Sderot, Israel (Besser & Neria, 2012). A longitudinal study conducted among students from the same college near Sderot reported rates of 20% during an escalation, with dramatic decreases to 3% and 2.2%, 2 and 4 months after ceasefire, respectively (Neria, Besser, Kiper, & Westphal, 2010).

**Probable depression prevalence.** Three studies assessed depression prevalence (Ben-Ezra et al., 2015; Neria et al., 2010; Palmieri et al., 2010). One cross-sectional study found a high rate of 35.2% depression prevalence during an escalation (Ben-Ezra et al., 2015). Palmieri et al. (2010) measured depression during “routine” and found a much lower rate of 6% among a CTS sample and 5.6% in a non-CTS comparison group, although the sample in this study included individuals from communities with moderate intensity of exposure, and only for 2 years before the study. A longitudinal study found depression rates of 45.2% during escalations, which dropped significantly to 22.2% at both 2 and 4 months after ceasefire, although this rate is still high (Neria et al., 2010).

**Other probable psychopathology prevalence and distress.** Rates of probable *acute stress disorder* during an escalation were 10.6% and 12% in two cross-sectional studies reported in the same article (Ben-Ezra, Palgi, Shrira, & Hamama-Raz, 2013). A longitudinal study using the clinical cutoff for *generalized anxiety disorder* symptoms among college students found a high probable generalized anxiety disorder rate of 57.8% (Neria et al., 2010), which dropped to 21.5% and 12.6% (2 and 4 months after ceasefire, respectively). High levels of *psychological distress* were found in 58.9% of a highly exposed CTS group during an escalation; however, there were no reports concerning rates from this sample in routine times, or from any longitudinal or comparison group (Ben-Ezra et al., 2015). In a cross-sectional study, Chipman et al. (2011) found a high *stress-related impairment* rate of 29% among a CTS group.

These findings indicate that rates of probable psychopathology seem to be linked to current intensity of rocket fire; during escalations, the rates were generally higher than during routine times. Additionally, the findings that the clinical picture of samples with high CTS exposure includes various manifestations of distress suggest that it is important to conceptualize, investigate, and treat reactions to ongoing exposure to rocket fire through a broader lens than simply focusing on PTSD.

## Risk and Protective Factors

The reviewed studies assessed the role of various well-established risk factors for psychopathology in the trauma literature including demographics, socioeconomic and exposure factors, as well as various interpersonal and intrapersonal factors.

**Demographic factors.** Demographic risk factors identified by the reviewed studies included being female (Besser & Neria, 2009; Besser, Neria, & Haynes, 2009; Nuttman-Shwartz, 2014), being married (Nuttman-Shwartz, 2014), and being older (Dekel & Nuttman-Shwartz, 2009). A high rate of 40.5% probable PTSD was found in Nuttman-Shwartz et al.’s (2015) study among elderly individuals living in Sderot. Finally, Palgi et al. (2015) found the highest PTSD rates in older males with a low level of negative life events.

**Socioeconomic factors.** The CTS groups that have had the greatest intensity and longest duration of exposure live either in the development town of Sderot, or in kibbutz or other small close-knit rural villages. There are differences between Sderot and the other communities characterized by level of communal living and by the SES of the residents. Accordingly, a number of studies compared Sderot residents with residents of the rural communities. Extremely high rates of probable PTSD were reported by residents of the Sderot development town: 26.4% (Gelkopf et al., 2012), 26% (Nuttman-Shwartz & Dekel, 2009), and 35.2% (Stein et al., 2013). In contrast, residents of nearby highly exposed rural communities reported lower rates of probable PTSD: 5.6% (Gelkopf et al., 2012), 6% (Nuttman-Shwartz & Dekel, 2009), and 6.6% (Stein et al., 2013). Stein et al. (2013) investigated the effect of socioeconomic factors on psychopathology in these groups, and found that education level was negatively related to depression only in Sderot, whereas in the rural community it was economic status that was negatively related to psychopathology. Other studies found a significant main effect of low SES, beyond community of residence (Nuttman-Shwartz & Dekel, 2009; Nuttman-Shwartz et al., 2015).

**Exposure.** Exposure was assessed in a number of ways across studies; although some defined exposure based on living within rocket range or within a set distance from the Gaza border, other studies included objective exposure (exposure to specific events), subjective exposure (appraisal of threat), or professional exposure (secondary trauma) questions.

Most of the reviewed studies found significant associations between proximity to the border and psychopathology (Besser et al., 2009; Besser & Neria, 2009; Besser & Priel, 2010; Besser, Zeigler-Hill, Pincus, & Neria, 2013; Besser, Zeigler-Hill, Weinberg, Pincus, & Neria, 2015; Gelkopf et al., 2012), whereas only some did not (Besser & Neria, 2012; Braun-Lewensohn & Rubin, 2014; Palmieri et al., 2010).

Three articles compared probable PTSD rates of Sderot residents with that of other urban non-CTS communities without rocket exposure. Three studies found remarkably similar probable PTSD rates among CTS groups from Sderot, ranging between 26 and 27%, whereas the comparison urban non-CTS groups reported between 1.5 and 6% probable PTSD (Besser & Neria, 2009; Gelkopf et al., 2012; Nuttman-Shwartz & Dekel, 2009).

Personal/objective exposure measured by different items concerning specific shelling-related events was positively related to

probable PTSD, depression, anxiety, stress symptoms, and lower levels of functioning in all relevant studies (Chipman et al., 2011; Dekel & Nuttman-Shwartz, 2009; Dickstein et al., 2012; Finklestein, Stein, Greene, Bronstein, & Solomon, 2015; Gil, Weinberg, Or-Chen, & Harel, 2015; Nuttman-Shwartz, 2014; Nuttman-Shwartz & Dekel, 2009; Nuttman-Shwartz et al., 2015; Palgi et al., 2015; Stein et al., 2013) but one that found that number of exposure events (attacks) was not related to severity of distress (Neria et al., 2010). Braun-Lewensohn and Rubin (2014) compared two CTS groups with a non-CTS group and found that intensity of exposure (dose-response) rather than proximity was associated with higher levels of distress. Similarly, Chipman et al. (2011) found that the relationship between living in an exposed community and PTSD symptoms remained only marginally significant when accounting for other subjective exposure variables.

**Interpersonal factors.** As with Type I and Type II trauma exposure, interpersonal factors seem to play a key role in the emergence of psychopathological symptoms in the context of CTS. Social support was found to be negatively associated with PTSD and depression both at the same time point and longitudinally (Besser & Neria, 2010), and with dissociative symptoms at the same time point (Besser, Weinberg, Zeigler-Hill, & Neria, 2014). Similarly, social support seeking was associated with higher depression, anxiety, and stress (Dickstein et al., 2012; Nuttman-Shwartz, 2014). High sense of belonging to the community was found to play a protective factor for PTSD (Nuttman-Shwartz & Dekel, 2009), especially for rural community residents. It may be that interpersonal factors are particularly important aspects of resilience in the context of CTS exposure, when whole communities are exposed.

**Intrapersonal factors.** Among CTS populations, anxious attachment was found to be highly related to PTSD as well as depression (Besser & Neria, 2010, 2012). In a comparative study, Besser and Priel (2010) found higher levels of dependency in the CTS group as compared with a nonexposed group.

The link between perceived stress and PTSD was significantly stronger in the CTS group compared with the non-CTS group (Besser & Neria, 2009). Perceived stress also increased the effect of personality risk factors on PTSD—under high perceived stress-related exposure, self-criticism was associated with increased psychopathology longitudinally (Lassri, Soffer-Dudek, Lerman, Rudich, & Shahar, 2013). Other intrapersonal factors found to be related to psychopathology were prejudiced attitudes, which were found to be positively related to PTSD symptoms only among the CTS group compared with the non-CTS group (Besser & Neria, 2009), and perceived self-responsibility (for personal reactions), which was positively associated with PTSD longitudinally (Ben-Ezra et al., 2015). Substance use coping and denial/disengagement were related to higher depression, anxiety, and stress (Dickstein et al., 2012).

Among the intrapersonal factors that were measured and found to act as protective factors in the reviewed papers were a sense of coherence, which was negatively associated with distress in the CTS group with the proximity to the border (Braun-Lewensohn & Rubin, 2014), and hope, optimism, and self-esteem, which were all negatively related to PTSD levels (Besser et al., 2014). Acceptance and positive reframing were negatively related to levels of PTSD, depression, anxiety, and stress (Dickstein et al., 2012). Life satisfac-

tion was also negatively related to PTSD severity in the CTS group (Besser & Neria, 2009).

## Discussion

The goal of the current article was to systematically review the current knowledge concerning the clinical picture of Israeli civilians exposed to prolonged traumatic stress, to better understand the effects of this kind of exposure and consider risk and protective factors. The reviewed studies indicated that probable PTSD rates are higher in CTS groups compared with non-CTS groups. There was a large range of probable PTSD rates in the CTS population, and these differences seem to be related to community of residence and whether the study was conducted during an escalation or “routine” period. Exposure was found to be related to probable PTSD in most of the reviewed studies, along with a broad range of other distress outcomes such as depression, anxiety, somatization, and sleep difficulties.

The PTSD rates in the CTS groups reported by the reviewed studies are higher than those in the comparative non-CTS groups, and are also markedly higher than PTSD rates found in large epidemiological studies (e.g., past-year PTSD prevalence of 3.5% among adults in the U.S. National Comorbidity Survey Replication; Gradus, 2007). The high rates found specifically among Sderot residents (urban sample) were similar to those found in other highly trauma-exposed urban samples (Liebschutz et al., 2007; Westphal et al., 2011).

We were not able to sufficiently address the question of what happens to populations with ongoing exposure to rocket fire over time. Most of the papers reviewed used cross-sectional designs that did not capture the fluctuations in distress caused by current levels of exposure. However, the findings of these studies suggest that psychopathology and distress appeared to spike sharply during escalations, and then abate when intensity of exposure dropped in routine times; however, this was only assessed directly in the study by Neria et al. (2010). These studies indicate that CTS reactions may be more transient and context dependent than is typical for PTSD and depressive states.

Eagle and Kaminer (2013) question whether psychological reactions to CTS are maladaptive, as they occur in context of a realistic and ongoing threat. Similarly, on the basis of their clinical experience treating the population in the Gaza CTS area, Diamond et al. (2010) argue that PTSD may not be the most accurate descriptor for the reactions of the Israeli inhabitants of the area and that what are described as PTSD symptoms in other situations may in fact be normative coping responses to the imminent threats of the situation. Thus, posttraumatic reexperiencing is replaced with a general feeling of fear; hypervigilance is linked to the anticipation of oncoming missiles; and avoidance symptoms are better conceived as functional reality-based coping that entails avoiding areas that are likely to be hit by missiles (Diamond et al., 2013). As such, they argue that the symptoms constellation within CTS may be better interpreted as adaptive coping to an aversive environment, or even the commonly used phrase of a normal reaction to an abnormal situation. The conceptual argument posed by Diamond et al. (2010) is not dissimilar to what previous CTS research in Israel has found. Israelis responded to the first Gulf War and the second Intifada with intense, yet short-lived, distress, but levels of

clinical disorders were minimal (Solomon, 1995; Tuval-Mashiach & Shalev, 2005).

Yet this framing of the situation leaves critical questions unanswered. The current review indicates that a significant proportion of the CTS population appear to meet criteria for psychopathology. Even if these “symptoms” are actually transient adaptive reactions to a traumatic stressor, and abate in various situations, the CTS resident lives under nearly constant threat, and usually with a high level of actual exposure. The reactions may be understandable, but this abnormal situation has become the reality of daily life for those experiencing CTS over many years. Therefore, a conceptualization focused on functional impairment and generalized distress, rather than standard symptom-based diagnostic criteria, may better be able to capture the suffering experienced by many of those living with CTS exposure.

The reviewed studies did not indicate a clear relationship between exposure and psychopathology. This may be owing to varied operationalization of “exposure” across the reviewed studies. Proximity to the border was sometimes used as a proxy for exposure; however, as the range of rocket fire has steadily increased, this was not necessarily informative. Furthermore, in many cases, proximity to the border was not equivalent to level of threat or actual exposure. Indeed, the relationship between proximity to the border and distress yielded different results across studies. Other exposure measures used by the reviewed studies were also problematic, as they generally inquired about specific events but did not assess the cumulative level of exposure over time. Furthermore, only a few of the reviewed studies included a non-CTS comparison group. Future studies comparing various CTS populations with different intensity and duration of exposure, together with comparison non-CTS samples, could help clarify our understanding.

An alternative explanation is that the typical dose–response relationship between exposure and psychopathology, as reported in many previous studies of trauma exposure, may be less relevant than current exposure for those living with CTS. It may also be that severity of exposure is not uniformly associated with all types of psychopathology (Helpman, Besser, & Neria, 2015). Further investigation is needed to understand whether exposure differentially affects various kinds of PTSD symptoms. Finally, all the longitudinal studies included in the review assessed overall rates of psychopathology at each time point. Yet, it may be, for example, that although some people adapt to the situation over time, others become more distressed as the exposure continues. A more nuanced picture could emerge through studies that investigate latent groups with different trajectories (Bonanno & Mancini, 2012; Greene et al., 2017).

Socioeconomic factors emerged as consistent risk and protective factors in the reviewed studies, namely, the SES level and the type or sense of community. Ongoing exposure to conflict and trauma entails a process of degradation of different psychological, social, and economic resources, at the individual and communal levels, which have been found to be associated with distress (Hobfoll et al., 2008). The reviewed articles indicated that low economic status and lack of social support (and high expectation of support) were particularly salient risk factors for psychopathology in the CTS population compared with non-CTS, reflected in the high distress levels found in all of the studies assessing Sderot residents. These findings are also in line with other studies, among other CTS

populations (see Miller & Rasmussen, 2010). The protective effects of having higher personal and communal psychosocial and economic resources were demonstrated in the reviewed studies. Community resources may be easier to boost than personal resources, and it may therefore be helpful to conduct interventions at a community level focused on boosting factors such as community cohesion and community efficacy. The reviewed articles suggest that when assessing risk in CTS populations, the SES level and sense of community should be considered, beyond the intensity and duration of exposure to traumatic events.

The current systematic review has a number of limitations that ought to be mentioned. There was a great deal of variation between studies regarding sample size, sample type, and the measurement tools used to assess psychopathology, all of which make it hard to compare and draw firm conclusions. Second, this review was based on published studies and therefore subjected to the “file-drawer” effect, possibly skewing the apparent prevalence rates of psychopathology. Third, although this review enabled an in-depth investigation of a specific CTS population, it is unclear how applicable these findings are to other CTS contexts.

Future research should investigate changes in reported symptoms as a function of the intensity of exposure, including daily diary studies, and longitudinal studies with multiple assessment waves that could better capture the lability of trauma reactions, particularly when related to peritraumatic exposure. Moreover, the duration of exposure and long-term response trajectories should be investigated assessing whether, and in whom, habituation to the stressors occurs. Future research may want to broaden the psychiatric symptoms measured among this population to create a broader understanding of the emerging symptomatic response to this kind of stress. Finally, it is important to use the findings of this review to frame research focused on identifying risk and protective factors in this particular CTS context, but also in other populations living with CTS, including Palestinian groups, other populations living in conflict situations, and people exposed to a high degree of community violence.

In conclusion, this review presents the complex clinical picture of psychological reactions to CTS in the population of southern Israel, with high rates of probable psychopathology, even in periods of relative calm, and which seem to rise sharply during escalations. This review identified a number of high-risk groups based on community of residence, level of exposure, socioeconomic factors, and perceived social support. Although this review does not provide sufficient evidence on the question of whether these CTS reactions should be considered “true” psychopathology, the findings of these studies indicate widespread and persisting distress. Future research and interventions should focus on how best to buffer distress in these vulnerable groups targeting the intrapersonal, social, and communal factors highlighted in this review.

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