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Peritraumatic dissociation and post-traumatic stress disorder in individuals exposed to armed conflict in the Democratic Republic of Congo

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ABSTRACT

The purpose of this study was to verify the hypothesis that there is an association between peritraumatic dissociation (PD) and post-traumatic stress disorder (PTSD) in individuals exposed to recurrent armed conflict. More specifically, we sought to evaluate whether PD differentially predicts PTSD according to the degree of exposure to the potentially traumatic event (PTE), the level of education, and gender. A total of 120 individuals between 17 and 75 years of age, including 51 women, completed the Traumatic Events List, the Peritraumatic Dissociative Experiences Questionnaire, and the French version of the Posttraumatic Stress Disorder Checklist Scale, as well as a questionnaire providing information regarding sociodemographic details. The group of participants with high scores for PD had significantly more PTSD. PD differentially predicts PTSD depending on the level of education and gender of the individual. Those who had been physically assaulted and raped, as well as the less educated, were more likely to be dissociated during PTE exposure compared to witnesses and those with a higher level of education. The primary target population for prevention and early management should comprise individuals with high levels of PD, low levels of education, and women.

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Post-traumatic stress disorder; armed conflict; peritraumatic dissociation; gender; education

Introduction

Armed conflict exposes the civilian population and military personnel to the development of post-traumatic pathology conditions including post-traumatic stress disorder (PTSD) (Crocq, 1999). The first intervention for victims in situations of armed conflict is not necessarily psychological, but has to provide

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external security (the knowledge of being out of danger) and then care (for those who have been wounded and/or raped), adequate shelter (for people who have been internally displaced), and food. Once these elements have been put in place, it is important to approach psychological management through the secondary prevention of PTSD, which is the main psychopathology in the context of armed conflict, often resulting in substantial comorbidity (Lalonde, 2011; Oquendo et al., 2005). People with PTSD experience disruption of their daily functioning, and it can often affect their ability to work and to effectively integrate into society (e.g., with family and friends) (Thomas, 2018).

Research on factors associated with the development of PTSD generally distinguishes between three categories of factors (Côté, 1996; Guay et al., 2006). The first relates to pretraumatic vulnerability factors (i.e., occurring before exposure to the potentially traumatic event). Peritraumatic factors fall into the second category: when the individual is exposed directly or indirectly to trauma, the severity, or the type of potentially traumatic event (PTE) that is experienced, as well as the emotional, cognitive, neurological, and physiological reactions of the individual play a role. The third category relates to post-traumatic factors (i.e., occurring after the period of exposure to the PTE) and the PTE's characteristics (Guay et al., 2006; Sareen, 2014).

This article focuses on peritraumatic risk factors, mainly peritraumatic dissociation (PD) and the degree of exposure to PTE. It also specifically addresses two personal pre-traumatic factors: the level of education and the individual's gender.

Numerous studies indicate that PD is a relevant vulnerability factor for the development of PTSD (Birmes, Sztulman, & Schmitt, 2002; Carlson, Dalenberg, & McDade-Montez, 2012; Galatzer-Levy, Madan, Neylan, Henn-Haase, & Marmar, 2011; Kédia, 2009; Ozer, Best, Lipsey, & Weiss, 2003; Schauer & Elbert, 2010; Yiaslas et al., 2014). PD is characterized by detachment, an absence of emotional reactivity, a sense of derealization, depersonalization, with automatic behaviors, and an alteration of spatiotemporal and/or bodily perception during exposure to PTE or a few hours later (Kédia, 2009; Louville & Salmona, 2013).

A meta-analysis highlighted the association between PD and PTSD (Lensvelt-Mulders et al., 2008). This meta-analysis included 59 studies with a total population of 16,547 individuals (mean weighted effect size = 0.401). A second meta-analysis on the same topic (Breh & Seidler, 2007) identified 34 studies (N = 6853) with a global effect ($r = 0.36$). Some factors that influence this association have been studied, such as the methodology used, the population studied, and the time elapsed (Lensvelt-Mulders et al., 2008; Ozer et al., 2003).

In addition to the degree of exposure to the PTE that places importance on controls, this study focuses on educational level and gender. The choice of two back variables is justified by the fact that they have been identified as risk factors in previous studies (Brewin, Andrews, & Valentine, 2000; Ozer et al., 2003) but also because many of the women are not educated in the region

where the study was conducted (Furaha Mirindi, 2016; Kikumbi & Depaepe, 2018; Mihigo & Bashige, 2017).

The aim of this study was to test the hypothesis that there is a link between PD and PTSD in the context of recurrent armed conflicts (hypothesis 1). More specifically, it sought to assess whether PD differentially predicts PTSD according to the degree of exposure to PTE (hypothesis 2), the level of education (hypothesis 3), and gender (hypothesis 4) in an African population that was subjected to violence related to armed conflict, given that the majority of the studies carried out to date on this subject have involved European and American populations. This article aims to at least partially fill this gap in the scientific literature.

Method

Participants

The study received approval from the Ethics Committee of the Faculty of Psychological Sciences and Education of the *Université libre de Bruxelles* and from the School of Public Health of the *Université de Kinshasa*. The respondents confirmed their consent to participate by either returning the signed and completed consent form, or simply by completing the questionnaire. To ensure anonymity, each questionnaire received a unique identification number. To be included in the study, the participants had to meet certain criteria: (i) to have been a direct victim (i.e., physically assaulted or raped) of violence related to armed conflict; (ii) to have been an indirect victim; that is to say, having witnessed violence related to armed conflict and/or be a family member or friend of the direct victims in reference to criteria A2 and A3 of PTSD in the fifth edition of the diagnostic and statistical manual of mental disorders (American Psychiatric Association et al., 2015); (iii) direct or indirect exposure (see criteria i and ii) must have occurred within the targeted area in the 5 to 12 week period prior to the study; (iv) be 16 years of age or over; (v) have the ability to sufficiently understand the French language; and (vi) accept the research protocol framework and procedure on the basis of informed volunteering.

A total of 120 individuals participated in the survey that took place in eastern areas of the Democratic Republic of Congo (DRC) (Ituri: the territories of Mambasa and Irumu, North Kivu: the territory of Beni and Lubero and South Kivu: the city of Bukavu and its surroundings) from February to November 2016 regarding violence related to armed conflicts committed during the period from November 2015 to October 2016. These participants were recruited in the general referral hospitals and non-governmental organizations providing care to victims of violence related to armed conflict.

Peritraumatic dissociation

The Peritraumatic Dissociative Experiences Questionnaire (PDEQ) was created in English (Marmar et al., 1994) and translated and validated in French (Birmes et al., 2005). This is a 10-item self-administered test ($\alpha = 0.97$) that provides a retrospective measure of the perception of dissociation experiences that arise during a PTE, as well as in the hours immediately afterward. Each item is rated from 1 (not true at all) to 5 (entirely true). The total score is calculated after summation of 10 items, and ranges from 10 to 50. A score greater than or equal to 22 attests to the presence of clinically significant PD (Birmes, 2001). PDEQ has been studied in a qualitative form in terms of high and low scores for PD. The following is an example of a PDEQ item: “*My perception of time was altered; events seemed to be taking place more slowly*”.

Type of trauma experienced and degree of exposure

The type of PTE experienced by the participants and the degree of direct or indirect exposure was measured using a traumatic event screening questionnaire, namely the “List of Traumatic Events”. This scale is part of the Clinician-Administered Post Traumatic Stress Disorder Scale for DSM-IV (CAPS1), which is a structured and standardized clinical interview devised by Blake et al. in 1995 (Blake et al., 1995) to assess symptoms of PTSD.

The Traumatic Events list includes a series of potentially traumatic events. The participant indicates if this happened to them or whether they witnessed it. We added the option of indicating the date (year and month) that the PTE occurred, which allowed us to determine the time elapsed (in weeks) since the last PTE. For this study, we retained only PTE related to armed conflict: (i) physical aggression (e.g., being attacked, beaten, stabbed, kicked, etc.), (ii) an armed attack (e.g., having been wounded by a firearm or sharp weapon, being threatened with a knife, a firearm or a bomb, etc.) (iii) sexual assault (e.g., being raped, subject to attempted rape, forced to perform any sexual act by force or under threat), (iv) captivity (e.g., having been kidnapped, taken hostage, imprisoned as a prisoner of war, etc.), (v) any other situation or very stressful experience related to armed conflict. For the sequelae, we considered physical aggression and armed attack in a particular type of PTE that we have called physical aggression. In the section on sexual assault, only rape was selected for this study.

Post-traumatic stress disorder

The Posttraumatic Stress Disorder Checklist Scale (PCL-S) for DSM-IV (because it refers to the symptoms of PTSD described by the DSM-IV). Three types of symptoms are measured by the PCL-S: symptoms of recurrence/intrusion, symptoms of avoidance/numbing, and symptoms of physiological hyper-arousal. It is composed of 17 items ($\alpha = 0.93$) corresponding to the symptoms graded from 1

(not at all) to 5 (very often). This instrument was created by Weathers, Litz, Herman, and colleagues in 1993. The translated and validated French version exhibits good psychometric properties (Bouvard & Cottraux, 2010; Yao et al., 2003): stability (test/retest reliability of 0.96), good diagnostic efficacy (for a score $\geq 44/85$) (Blanchard, 1996; Paul, Pommier de Santi, Marimoutou, & Deparis, 2013). The range of the score varies from 17 to 85. PTSD is positive with a score of 44 or higher (Bouvard & Cottraux, 2010). The following is an example of a PCL-S item (Reviviscence factor: “*Being disturbed by memories, thoughts, or images related to this event*”).

Statistical analysis

The data was organized and analyzed with Statistical Package for Social Science (SPSS) version 24 and Statistica version 13 software. The statistical significance level was set at 0.05. Nominal variables were described as frequencies and percentages, and continuous variables using means, standard deviations, and maximum and minimum values. We performed Pearson’s chi-square (χ^2) tests to assess the possible association between participants with clinically significant dissociation versus clinically insignificant dissociation and: the degree of exposure to PTE (direct/indirect victims), gender (male/female), and the level of education (primary/secondary and higher). A t-test was performed to evaluate the difference in the mean PCL-S scores according to high or low scores for PD. Factorial ANOVAs followed by a post-hoc test of interactions (using the Newman-Keuls test) were performed to check whether the PCL-S score differed according to PD and the degree of exposure to PTE, as well as gender and the level of education.

Results

Characteristics of the sample

Of the 120 participants, 51 (42.5%) were women and 69 (57.5%) were men, with an average age of 38.3 years (ranging from 17 to 75 years). There were 65 (54.2%) indirect victims or witnesses and 55 (45.8%) direct victims among them, of whom 33 (27.5%) had been physically attacked and 22 (18.3%) had been raped. More than half of the participants, 67 in all (55.8%), had a primary education level and 53 (44.2%) had a secondary or higher level of education. In terms of ethnicity, 81 (67.5%) of the participants belonged to one of the indigenous tribes of the entire region. More than half (58.3%) of the participants were determined to be positive for symptoms of PTSD. [Table 1](#) presents the means and standard deviations for the total PCL-S and its three evaluated subdimensions.

Peritraumatic dissociation

Forty-seven participants (39%) had high scores for PD symptoms (using a cut-off >22 according to PDEQ). The degree of exposure to PTE ($\chi^2(1) = 7.84, p = 0.005$)

Table 1. PCL-S scores.

	Low scores for PD	High scores for PD	Total
	N = 73	N = 47	N = 120
PCL-S Total Mean (standard deviation)	40.08 (17.73)	53.89 (18.46)	45.59 (19.18)
PCL-S Intrusion Mean (standard deviation)	13.64 (6.36)	17.89 (6.05)	15.31 (6.55)
PCL-S Avoidance Mean (standard deviation)	15.70 (7.48)	21.17 (7.61)	17.84 (7.96)
PCL-S Hyper-arousal Mean (standard deviation)	10.74 (5.44)	14.83 (6.52)	12.34 (6.19)

and the level of education ($\chi^2(1) = 4.70, p = 0.03$) were significantly associated with PD. The PD score for the direct casualty group was 2.91 times higher than the score for the indirect victim group. Primary-level participants had a PD score 2.31 times higher than the score for the secondary and higher-level participants.

PTSD and peritraumatic dissociation

In agreement with the hypothesis 1 that PTSD is linked with PD, we found that the participants with high scores for PD had higher PCL-S scores ($M = 53.89, SD = 18.46$) than the participants with low scores for PD ($M = 40.08, SD = 17.73$). This effect was significant, $t(118) = -4.99; p < .001; d = 0.42$.

PTSD, peritraumatic dissociation, the level of education, and gender

Hypothesis 2 was tested using a 2 (high scores for PD vs. low scores for PD) \times 2 (direct vs. indirect victims) intersubject factorial ANOVA with PCL-S as the dependent variable. Results show a main effect of dissociation on PTSD confirming previous results. However, the interaction was not significant, thus no differential effects of dissociation on PTSD symptoms on direct versus indirect victims can be seen. Table 2, 3, and 4 present descriptive statistics.

Hypothesis 3 was tested through a 2 (high scores for PD vs. low scores for PD) \times 2 (primary level vs. secondary and higher level) intersubject factorial ANOVA with PCL-S as the dependent variable. Results show the same main effect of dissociation on PTSD. Furthermore, confirming hypothesis 2, the interaction was significant. The study of simple effects shows that the participants who had a secondary or higher level of education with low scores for PD ($M = 33.26$) developed significantly fewer PTSD symptoms than participants with the same

Table 2. Mean PCL-S scores according to the PD and gender.

	Low scores for PD		High scores for PD		Total
	Men	Women	Men	Women	
	N = 42	N = 31	N = 27	N = 20	
PCL-S total M (SD)	42.69 (17.72)	36.55 (17.41)	48.22 (19.10)	61.55 (14.77)	45.49 (19.17)
PCL-S Intrusion M (SD)	14.67 (6.10)	12.26 (6.53)	15.85 (6.36)	20.65 (4.40)	15.31 (6.55)
PCL-S Avoidance M(SD)	16.69 (7.90)	14.35 (6.75)	19.11 (8.04)	23.95 (6.13)	17.84 (7.96)
PCL-S Hyper-arousal M (SD)	11.33 (5.42)	9.94 (5.45)	13.26 (6.01)	16.95 (6.74)	12.34 (6.19)

Note: M = mean, SD = Standard Deviation

Table 3. Mean PCL-S scores according to the PD and the level of education.

	Low scores for PD		High scores for PD		Total N = 120
	Secondary and higher level	Primary level	Secondary and higher level	Primary level	
	N = 38	N = 35	N = 15	N = 32	
PCL-S total M(SD)	33.26 (15.34)	47.49 (17.36)	53.73 (20.18)	53.97 (17.93)	45.49 (19.17)
PCL-S Intrusion M (SD)	11.24 (5.78)	16.26 (5.98)	17.33 (6.49)	18.16 (5.93)	15.31 (6.55)
PCL-S Avoidance M(SD)	13.03 (6.47)	18.60 (7.50)	21.27 (8.26)	21.13 (7.42)	17.84 (7.96)
PCL-S Hyper-arousal M(SD)	9.00 (4.71)	12.63 (5.61)	15.13 (6.59)	14.69 (6.60)	12.34 (6.19)

Note: M = mean, SD = Standard Deviation

Table 4. Mean PCL-S scores according to the PD and the degree of exposure to PTE.

	Low scores for PD		High scores for PD		Total N = 120
	Indirect victims	Direct victims	Indirect victims	Direct victims	
	N = 47	N = 26	N = 18	N = 29	
PCL-S total M(SD)	41.21 (18.12)	38.04 (17.17)	51.22 (20.13)	55.55 (17.50)	45.59 (19.17)
PCL-S Intrusion M(SD)	14.11 (6.43)	12.81 (6.25)	16.94 (6.72)	18.48 (5.65)	15.31 (6.55)
PCL-S Avoidance M(SD)	16.15 (7.71)	14.88 (7.10)	19.28 (8.00)	20.44 (7.69)	17.84 (7.96)
PCL-S Hyper-arousal M(SD)	10.96 (5.68)	10.35 (5.07)	15.00 (6.22)	14.72 (6.81)	12.34 (6.19)

Note: M = mean, SD = Standard Deviation

level of education but with high scores for PD ($M = 53.73; p < .001$), the participants with a primary level of education with high scores for PD ($M = 53.97; p < .001$), and those with a primary level of education with low scores for PD ($M = 47.49; p < .004$).

Hypothesis 4 was tested through a 2 (high scores for PD vs. low scores for PD) x 2 (men vs. women) intersubject factorial ANOVA, with PCL-S as the dependent variable (Table 4). The same main effect of dissociation on PTSD is reported and, confirming hypothesis 3, the interaction was significant. Simple effects shows that women with high scores for PD ($M = 61.55$) had significantly more PTSD symptoms than men with high scores for PD ($M = 48.22; p < .005$) or low scores for PD ($M = 42.69; p < .001$) and women with low scores for PD ($M = 36.55; p < .001$).

Discussion

The aim of this study was to test the hypothesis that there is a link between PD and PTSD related to armed conflict, and to identify factors that significantly interact with PD in the development of PTSD. Although prior research has documented a significant association between PD and PTSD, there is scant information regarding victims of violence related to armed conflict in Africa in general and the DRC in particular.

In addition to the finding that one in three of the participants had high symptoms of PD, our results clearly show a link between PD and PTSD. That is to say, our results indicate that the presence of a clinically significant dissociation during or shortly after a PTE increases the likelihood of subsequently developing PTSD. These results confirm the conclusions of the two meta-analyses carried out to date on the link between dissociation and PTSD (Breh & Seidler, 2007; Lensvelt-Mulders et al., 2008) as well as studies carried out with the aim of evaluating the predictive power of PD on the development of PTSD in Canada (Martin & Marchand, 2003), the United States (Bernat, Ronfeldt, Calhoun, & Arias, 1998), Belgium (Versporten, Zech, De Soir, & Van Oyen, 2006), and Vietnam War veterans (Bremner et al., 1992).

We found that the interaction between PD and the degree of direct or indirect exposure to PTE was not significantly related to the development of PTSD. Although direct victims had nearly three times more PD than controls, this did not make them more vulnerable to developing PTSD. Furthermore, with regard to witnesses, the strong sense of solidarity in African society (Boni, 2011) increases the likelihood of witnesses being highly affected by the violence experienced by their friends or family. In addition, the recurrence of armed conflicts in the study area (Bennet & Taiwo, 2017) also explains this phenomenon. This notion is similar to what Brunet (1996) calls “increasing inoculation”. It suggests that recurring exposure to trauma, for all the pain that it entails, also favors adaptation and allows subsequent traumatic situations to be coped with better.

Our results also show that education level interacts significantly with PD in predicting PTSD. In addition to the finding that the group of less educated individuals had twice as many symptoms of PD and consequently more PTSD, better-educated participants were found to have significantly fewer symptoms of PTSD. Perhaps more educated people have a better knowledge of the psychological consequences of PTE and can react differently in terms of seeking help and mentalizing the situation. As PTSD is seen as a sign of inadequate processing of information (Baeyens, 2003), a high level of education should promote the processing of PTE-related information. In addition, a main effect of the level of education was observed on all of the symptoms of PTSD and on the recurrence/intrusion subdimension, in contrast to the other two subdimensions, namely avoidance and hyper-arousal. Intrusion symptoms are more of an involuntary dimension compared to the other two subdimensions considered in this study. This can, therefore, be influenced by the level of education. Several studies have shown that low education and/or low IQ are risk factors for a variety of psychological dysfunctions (Breslau, Chen, & Luo, 2013; Sayed, Iacoviello, & Charney, 2015; Tapia, Clarys, El-Hage, & Isingrini, 2007).

In terms of the role of gender in the association between PTSD and PD, being male or female was not associated with PD or the development of PTSD. Only the interaction between gender and PD was significantly related to the development of PTSD, particularly indicating the vulnerability of women with high scores for PD,

followed by that of men with high scores for PD. However, the men with low scores for PD had more symptoms of PTSD than the women with low scores for PD, although this difference was not significant. According to our data, when considered on its own, being a woman was not significantly related to PD or the development of PTSD in this sample of individuals who had been exposed to armed conflict. These results fit with those of a meta-analysis conducted on this subject that covered 200 publications (Tolin & Foa, 2006) and concluded that the vulnerability of women to PTSD is often associated with other variables such as age, peritraumatic experiences of helplessness, the perception of danger, a high likelihood of death during the trauma, lack of employment, cultural and social considerations, etc. (Breslau, Davis, Andreski, Peterson, & Schultz, 1997).

The main limitation of this study is at the level of the diagnostic measure of PD by the PDEQ, which refers to a cut-off established on the basis of a study carried out on a French population (Birmes, 2001), which is culturally different from the Congolese population. A cultural validation of the PDEQ with an African population and a comparison of the characteristics of PD between European and/or American and African populations could give rise to a timely and relevant area of research.

Conclusion

PD is a relevant factor in the development of PTSD. Our research on a population of victims of violence related to armed conflict in the DRC found that individuals who had been physically assaulted and/or raped, as well as the less educated, were more likely to use dissociation during PTE exposure compared to witnesses and more educated individuals. PD differentially predicts PTSD depending on the level of education of the individual and their gender. The degree of direct or indirect exposure to PTE does not significantly influence the link between PD and PTSD.

The main novelty of this study was the confirmation of an association of other pre-traumatic factors (e.g., the level of education and gender) and peritraumatic factors (e.g., the degree of exposure to PTE) to explain the link between PD and PTSD on a population that had been subjected to violence related to armed conflict. This makes it possible to predict the profile of the most vulnerable people so as to prioritize care interventions. Secondary prevention can, therefore, consider the three-fold psychological (PD), biological (gender), and social (the level of education) reality of the victims. Individuals with high levels of PD and/or low levels of education, as well as women, should be the primary target population for prevention and early care.

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