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ORIGINAL PAPER

Self-Reported Emotional and Behavioral Problems, Family Functioning and Parental Bonding Among Psychiatric Outpatient Adolescent Offspring of Croatian Male Veterans with Partial PTSD

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Abstract
Background Posttraumatic stress disorder (PTSD) in male veterans has been linked with impaired family relationships and psychopathology in their children. Less is known about symptoms in children of veterans with partial PTSD.
Objective To compare mental health problems, family functioning and parent–child bonding among adolescent offspring of male veterans with no PTSD, partial PTSD and full PTSD, and to examine the relationship between adolescent mental health problems and family factors.
Methods Consecutive outpatient adolescent offspring (12–18 years) of Croatian male veterans with no PTSD, partial PTSD and full PTSD matched for age, sex, educational level, family income, parental employment, nationality, and residential area reported on emotional and behavioral problems, family functioning and parent–child bonding.
Results The full PTSD group reported higher levels of total behavior problems, family functioning problems and parental control than the partial PTSD group, which in turn, reported higher levels than the no PTSD group. The partial and full PTSD groups reported comparable levels of emotional and behavioral problems, and parental care. The partial and no PTSD groups did not differ on maternal care, which was significantly higher in these

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groups than in the full PTSD group. Higher levels of emotional and behavioral symptoms were associated with lower levels of maternal care in the partial PTSD group.

Keywords Adolescent offspring · Male veterans · Partial PTSD · Behavior problems · Family functioning · Parental bonding

Introduction

Research suggests that exposure to traumatic experiences such as physical and sexual abuse, witnessing violence, war, terrorism, natural disasters, illness or injury, can trigger a number of negative outcomes in youth and children (Wyman et al. 1991; Carrión et al. 2002; Pat-Horenczyk et al. 2009; Stein et al. 2004; Weems et al. 2007). Adverse mental health outcomes are found to vary widely both in terms of type of trauma and extent of exposure, ranging from mild stress reactions, through posttraumatic stress disorder (PTSD) to psychopathological responses including somatic complaints, depression, anxiety, conduct disorder, functional impairment, etc. (Pat-Horenczyk et al. 2007, 2009; Qouta et al. 2008; Solomon and Lavi 2005; Thabet and Vostanis 2002). Most research has considered direct, physical exposure to the traumatic act as being a primary factor in determining subsequent PTSD, emotional and behavioral problems (Pfefferbaum et al. 2013). Additionally, research has focused on exposure through its relationship with a victim (also referred to as interpersonal or relational exposure; Pynoss and Eth 1985). Some studies also have investigated other types of so-called indirect exposure, such as near-miss experiences or exposure through the media (Aber et al. 2004; Pat-Horenczyk 2003; Pfefferbaum et al. 2003).

The impact of a traumatic event on an individual appears to be a complex interaction of the individual and the socio-ecological environment (Bronfenbrenner 1977; Weems and Overstreet 2008). Family and community factors appear to significantly affect adjustment of children in the wake of a traumatic event (Wyman et al. 1991; Stein et al. 2004; Schiff et al. 2010). Trauma research has identified a link between family trauma exposure, parent distress, negative parenting practices, low levels of family and social support, and more detrimental outcomes for children and adolescents (Hagan 2005; Scarpa et al. 2006; Weems and Overstreet 2008; Costa et al. 2009; Kelley et al. 2010; Kilic et al. 2003; Schiff et al. 2010; Banks and Weems 2014). The mental health of parents and children are intertwined, hence if parents experience serious psychological disturbance after traumatic experiences it is likely that their children will too (Kilic et al. 2003; Laor et al. 2001; Scheeringa and Zeanah 2008). Deterioration in parental mental health and impaired family relationships have been reported following natural disasters (Kilic et al. 2003; McFarlane 1987; Norris et al. 2002). This decline in family functioning adds to the stress on children as parents are less able to provide the usual safe, secure, stable and consistent environment which is essential for children's well-being (McFarlane 1987; Wyman et al. 1991). The parent–child relationship, the most salient microsystem influence in children's lives, plays an influential role in children's reactions to and recovery from trauma (Levendosky and Graham-Bermann 2000; Lieberman et al. 2005; Weems and Overstreet 2008). Costa et al. (2009) found that youths' pre disaster perceived attachment beliefs (i.e., trust and communication) and perceptions of parenting behaviors (i.e., acceptance and firm control) moderated the relation between pre and post Katrina anxiety symptoms. Parental

overprotection, excessive control and infantilization obstructed also children's recovery (Bokszczanin 2008). Community peer support may contribute to resilience following disasters; however, the protective effects of high peer social support may be diminished by high disaster exposure (Banks and Weems 2014).

A special form of interpersonal or relational exposure derives from relationship with individuals who directly experienced trauma and suffers from PTSD. Empirical research findings clearly indicate that veterans' PTSD following exposure to combat violence affects veterans' familial relationships and the psychological adjustment of family members (Galovski and Lyons 2004). Previous study within other trauma populations has conceptualized the negative impact of an individual's traumatic stress on his/her family members as "secondary traumatization" (Figley 1983). The term secondary traumatisation in its narrow sense refers to the transfer of nightmares, intrusive thoughts, flashbacks and other symptoms of PTSD that are typically experienced by traumatised individuals suffering from PTSD onto their immediate surroundings. In its broad sense, the term secondary traumatisation refers to any kind of distress transfer from someone who experienced trauma to those in their surroundings, and includes a broad spectrum of distress manifestation along with that resembling PTSD (Galovski and Lyons 2004).

Research has identified PTSD as mediating the effect of veterans' combat experience on the family (Davidson et al. 1989; Parsons et al. 1990; Jordan et al. 1992). Veterans' numbing/arousal symptoms are especially predictive of family distress; while, to a lesser extent, veterans' anger is also associated with troubled family relationships and secondary traumatization among family members (Harkness 1991; Ruscio et al. 2002; Galovski and Lyons 2004). Many studies have established that in comparison with children of combat veterans without PTSD, the children of combat veterans with PTSD have more frequent and more serious developmental, behavioural, and emotional problems (Rosenheck and Nathan 1985; Harkness 1991; Jacobsen et al. 1993; Caselli and Motta 1995; Beckham et al. 1997; Rosenheck and Fontana 1998; Ahmadzadeh and Malekian 2004; Zalihic et al. 2008).

Similarly to other trauma populations, severe and diffuse problems in family functioning have been found in families of male veterans with combat-related PTSD (Davidson and Mellor 2001; Jordan et al. 1992). Studies have also shown significant impairments in parenting for many PTSD male veterans with poor anger management and PTSD-related emotional numbing and withdrawal being particularly damaging to parent–child relationship which definitely impacts the development process of their children. (Jordan et al. 1992; Harkness 1993; Ruscio et al. 2002). Previous studies indicated that impaired family functioning and relationships may play a strong role in the development of emotional and behavioral problems among offspring of PTSD male veterans (Boričević Maršanić et al. 2014a, b).

While the secondary effects of living with a combat-related PTSD sufferer have been extensively studied, these issues have not yet been examined in veterans with PTSD symptoms that fall short of meeting full criteria. The specific constellations of symptoms characterizing partial PTSD (sometimes referred to as "subthreshold PTSD") have been variously described, but individuals with partial PTSD have generally been characterized as having experienced a traumatic event and subsequently reporting some, but not all, symptoms that are consistent with PTSD (i.e. not meeting criteria for "full" PTSD) (Blanchard et al. 1994; Carlier and Gersons 1995; Marshall et al. 2001; Stein et al. 1997; Weiss et al. 1992). Partial PTSD may result from partial recovery from the full syndrome or from the development of subthreshold symptoms after trauma (Marshall et al. 2001). Converging evidence suggests that partial PTSD conditions are clinically important. The prevalence and impairment of occupational, social, and home functioning of partial PTSD

appears comparable to that observed in full PTSD (Marshall et al. 2001; Stein et al. 1997). Degree of impairment increases as the number of PTSD symptoms increases (Marshall et al. 2001), and partial PTSD symptoms may progress to full PTSD (Carty et al. 2006). However, even if partial symptoms do not progress to full PTSD, the associated impairment of partial PTSD can be substantial, with significant and prolonged effects (Cukor et al. 2010).

In this study, we evaluated the extent to which levels of self-reported mental health problems, family functioning and parent–child bonding varied across three independent samples of adolescent offspring of Croatian male veterans admitted to the outpatient psychiatric treatment, those of fathers with full combat-related PTSD (the Full PTSD group), partial combat-related PTSD (the Partial PTSD group) and no combat-related PTSD (the No PTSD group). We used the phrase secondary traumatization in its broad, more inclusive definition and explored both emotional (internalizing) and behavioral (externalizing) problems among outpatient adolescent offspring of male veterans. We also examined the relationship between adolescent mental health problems and family factors (overall family functioning and parenting behaviors, in particular parental care and control) in outpatient adolescent offspring of male veterans with partial PTSD.

We hypothesized that the levels of self-reported adolescent mental health problems, problems in family functioning and parenting difficulties will be significantly higher in the two PTSD groups than in the no PTSD group. We also expect to find similar rates of adolescent mental health problems, problems in family functioning and parenting difficulties in the two PTSD groups. Finally, we hypothesize that higher levels of emotional and behavioral problems among outpatient adolescent offspring of male veterans with partial combat-related PTSD will be related to more problems in overall family functioning and more negative parenting behavior of both fathers and mothers.

Methods

Participants

This study was conducted at the Outpatient Department of the Psychiatric Hospital for Children and Adolescents, Zagreb, which is the largest mental health facility for child and adolescent psychiatry in Croatia. The hospital provides a continuum of services including outpatient, partial hospitalization, acute inpatient and resident care. Children's multidisciplinary team of child and adolescent psychiatrists (14 specialist working full-time during the study period), psychologists, speech therapists, occupational therapists, and social workers treat children from many backgrounds and with a wide variety of conditions, including adjustment disorders, anxiety disorders, affective disorders, developmental delays, depression, learning disabilities, psychotic disorders, severe disruptive behavior, and suicide attempts. The catchment area with more than 2 million inhabitants (400,000 aged under 21 years) is the largest in Croatia. The hospital receives more than 19,000 outpatient visits (100 new referrals per week), 850 inpatient hospitalizations and 375 partial hospitalizations per year. Other child and adolescent mental health care institutions in this catchment area provide only psychotherapy or psychosocial interventions.

The participants of this study were consecutively admitted adolescents aged 12–18 years to the outpatient unit from January 2008 to December 2011. To be eligible for this study, participants were required to: (1) have a biological father who was veteran of the 1991–1995 Homeland War in Croatia diagnosed with full chronic combat-related

PTSD, partial or subthreshold combat-related PTSD, or no combat-related PTSD by an independent expert team at the National Center for Psychotrauma, Department of Psychiatry, Dubrava University Hospital, Zagreb; and (2) live in intact families with both biological parents.

The expert examination at the National Center for Psychotrauma included structured diagnostic procedure and analysis of military service data, and has been described in detail elsewhere (Kozarić-Kovačić and Kocijan-Hercigonja 2001). Briefly, male veterans were first subjected to a structured clinical interview. Data about former and current psychiatric symptoms were collected using the following instruments: Clinician Administrated PTSD Scale (CAPS) (Blake et al. 1990), Clinical Global Impression scale (CGI; Guy 1976), the Trauma Questionnaire (Mollica et al. 1992), Mississippi Scale for Combat-related PTSD (Keane et al. 1988), and Minnesota Multiphasic Personality Inventory 2 (Hathway and McKinley 1989). The PTSD diagnosis and comorbid diagnoses were made according to the International Classification of Diseases, 10th Revision, criteria (ICD-10) (World Health Organization 2003). The final diagnosis of a lifetime and current PTSD was reached only in cases where all sets of criteria (psychiatric and psychometric) were fulfilled. Partial PTSD was defined as having at least one symptom in each criterion category or meeting criteria for one or two of three symptom clusters (i.e. reexperiencing, avoidance, or hyperarousal), but not meeting criteria for full PTSD.

Exclusion criteria for all adolescents included a history of direct exposure to war trauma or any other severe non war-related trauma, significant medical illness, and having a father with significant disability, war-related injury and non war-related PTSD. Patients diagnosed with intellectual disabilities, pervasive developmental disorders, schizophrenia spectrum disorders or associated neurological conditions were also excluded as well as adolescents who received either psychosocial or psychopharmacological interventions during the first visit.

During the 4-year study period, a total of 6,888 adolescent offspring of male veterans presenting for the first admission at the outpatient unit were screened for study inclusion. Of 3,311 adolescent offspring of veterans with full PTSD, 1,797 offspring of veterans with partial PTSD and 1,780 offspring of veterans without PTSD, 610 (18.4), 499 (27.7 %) and 664 (37.3) met eligibility criteria, respectively. Of 499 adolescent offspring of veterans with partial PTSD, 362 (72.5 %) scheduled a second visit, 261 (52.3 %) attended the second visit, 182 (69.7 %) gave informed consent prior to beginning assessments. 21 adolescent revoked consent and 53 did not complete the battery. The final sample included 108 adolescent children of male veterans with partial PTSD (the Partial PTSDgroup). For each adolescent child of male veteran with partial PTSD, we included the next available adolescent child of the same age, sex, educational level, parental education, family socioeconomic status, nationality, and residential area, of male veteran with full PTSD (the Full PTSD group) and of male veteran with war emotional trauma but without PTSD (the No PTSD group). In all cases, an adolescent came from a separate family.

The majority of participants were Croatian (97.2 %) and female (55.6 %); mean age for all participants was 15.2 years (SD = 2.61) and mean years of education was 8.9 years (SD = 2.79). Participants were primarily from urban areas (57.6 %) and low-class families (56.4 %), and had both parents who were unemployed (53.7 %).

Procedure

The study was approved by the Ethics Committee of the Psychiatric Hospital for Children and Adolescents, Zagreb. Each participant and one parent/guardian provided written

informed assent/consent to participate. Adolescents were invited to participate in this study after the initial assessment of all members of the multidisciplinary treatment team (child and adolescent psychiatrist, clinical psychologist, social worker, educational specialist, neuropediatric specialist). Psychiatric diagnoses were made according to the ICD-10 criteria (World Health Organization 2003). We followed a "best estimate" diagnostic procedure (Leckman et al. 1982). The final diagnosis was determined in a consensus meeting, attended by all members of the treatment team, who discussed the findings obtained in the multiple evaluations, with the exception of the self-report tools, which were not administered until the diagnosis was determined. In case of disagreement with each other's diagnosis, a decision was reached by mutual consensus. When consensus was not reached, the more experienced psychiatrist made the final decision. ICD-10 diagnoses were used to determine exclusion diagnoses. Participants returned on a second occasion and completed self-report measures described below before receiving any psychosocial or psychopharmacological intervention. The primary assessment method of adolescent psychopatology in this study was the Youth Self-Report (Achenbach 1991).

Measures

Demographics Questionnaire

A short questionnaire was created in order to obtain participants' age, sex, educational level, family income (according to state census tract data), parental employment status, nationality, and residential area.

The *Youth Self-Report* (YSR; Achenbach 1991) is one of the most recognized self-report questionnaire for the assessment of psychopathology in adolescents. Adolescents rate each of 112 items as 0 (not true), 1 (somewhat or sometimes true) or 2 (very true or often true). The YSR can be scored on eight syndrome scales: withdrawn/depressed, somatic complaints, anxious/depressed (together constituting the Internalizing Scale), rule breaking behaviour and aggressive behavior (together constituting the Externalizing Scale), social problems, thought problems and attention problems; and on a Total problem score which reflects overall adolescent behavioral and emotional functioning. The YSR has demonstrated highly acceptable reliability and validity (Achenbach 1991). Croatian version of the YSR was used in this study (Rudan et al. 2005).

The *Family Assessment Device* (FAD) (Epstein et al. 1983) is a 60-item self-report questionnaire assessing family functioning on six dimensions, Problem-Solving, Communication, Roles, Affective Responsiveness, Affective Involvement and Behaviour Control, plus a summary scale, General Functioning. FAD items are marked by the respondent as 'strongly agree', 'agree', 'disagree' or 'strongly disagree', scoring from one to four. Higher scores indicate less healthy functioning. The FAD has been found to have high levels of internal consistency across various types of families and can be completed by children greater than 12 years old (Epstein et al. 1983).

The *Parental Bonding Instrument* (PBI) (Parker et al. 1979) is a 25-item self-report questionnaire on parental rearing practices, using a 4-point Likert scale (*very like* to *very unlike*). The questionnaire yields scores for the two principal dimensions of parental behaviors and attitudes: care and control. The care dimension consists of 12 items and scores range from 0 to 36, with a high score indicating high care. The control dimension consists of 13 items and scores range from 0 to 39, with a high score indicating high control (overprotection). The PBI questions are answered for mother and father separately.

The PBI has been widely used and has been found to have good psychometric properties (Parker et al. 1979).

Data Analysis

Participants were divided into three groups: (1) adolescent offspring of veterans with no PTSD (No PTSD), (2) adolescent offspring of veterans with partial PTSD (Partial PTSD), and (3) adolescent offspring of veterans with full PTSD (Full PTSD). Participants were compared on self-reported emotional (internalizing) problems, behavioral (externalizing) problems, total problems, family functioning, parental bonding (maternal care, maternal control, paternal care, paternal control). Data are presented as mean ± standard deviation (SD).

Multivariate Analyses of Variance (MANOVA) was the primary data analytic strategy. If significant main multivariate effects were found, results were probed with tests of between subjects' effects. Scheffé's test was used for all posthoc comparisons.

The first MANOVA compared raw scores on the three YSR scales (i.e., internalizing, externalizing and total problems). The second MANOVA compared the three groups on family functioning (FAD total score) and parental bonding (i.e., maternal care and control, and paternal care and control). Partial Eta Square (η_p^2) was reported to describe effect sizes for significant differences (Small <0.06; Medium = 0.12; Large ≥0.16).

Multiple stepwise regression analyses were conducted to examine the predictive value of family functioning and parenting dimensions for emotional (internalizing) and behavioral (externalizing) problems in outpatient adolescent offspring of male veterans with partial PTSD.

The level of statistical significance was set at $p < 0.05$. All statistical analyses were performed with Statistical Package for Social Sciences for Windows, version 16.0 (SPSS Inc., Chicago, IL, USA).

Results

The Differences in Self-Reported Emotional and Behavioral Problems

The No PTSD, Partial PTSD and Full PTSD groups of outpatient adolescent offspring of male veterans were compared on the YSR Internalizing scale, Externalizing scale and Total Problems. Table 1 shows the Cronbach's alphas and mean ± standard deviation on the YSR measures. The internal consistency coefficients were adequate. A significant multivariate effect was found (Wilks' $\Lambda = 0.84$, $F = 9.42$, $p < 0.001$). Tests of between-subjects effects yielded significant differences for each YSR scale (Table 1). Specifically, adolescent offspring of male veterans with partial and full PTSD scored significantly higher on internalizing scale than adolescent children of veterans with No PTSD. Posthoc comparisons yielded no differences in internalizing symptoms between the Partial PTSD and Full PTSD groups. Adolescent offspring of male veterans with full PTSD scored significantly higher on externalizing scale than children of veterans with No PTSD. Posthoc comparisons yielded no differences in externalizing symptoms between the No PTSD and Partial PTSD groups, and between the Partial PTSD and Full PTSD groups. For Total problems, pairwise comparisons showed the Partial PTSD and Full PTSD groups scored significanly higher than No PTSD group, and Full PTSD group scored significanly higher than Partial PTSD group. Effect sizes were small to medium (η^2 ranged from 0.048 to 0.114).

Table 1 The differences in self-reported emotional and behavioral problems, family functioning and parent–child bonding across the groups of outpatient adolescent offspring of male veterans with no combat-related PTSD, partial combat-related PTSD and full combat-related PTSD[a]

Variable	α	No PTSD (1)	Partial PTSD (2)	Full PTSD (3)	F	Pairwise comparisons[b]
YSR						
Internalizing scale	0.86	28.28 ± 9.13	30.98 ± 6.66	32.98 ± 4.35	12.31*	1 < 2, 3
Externalizing scale	0.84	25.19 ± 3.24	26.11 ± 3.55	27.08 ± 3.54	8.11*	1 < 3
Total score	0.81	64.19 ± 10.86	68.43 ± 9.01	72.39 ± 9.95	20.59*	1 < 2<3
FAD	0.87	2.45 ± 0.27	2.63 ± 0.24	2.72 ± 0.20	38.79*	1 < 2<3
PBI						
Maternal care	0.92	26.75 ± 2.92	25.93 ± 2.53	24.06 ± 2.07	32.15*	1, 2 > 3
Maternal control	0.82	14.92 ± 3.25	16.05 ± 2.42	17.26 ± 3.81	14.34*	1 < 2<3
Paternal care	0.92	23.98 ± 4.00	22.71 ± 2.95	21.90 ± 2.39	11.74*	1 > 2, 3
Paternal control	0.87	14.86 ± 4.28	16.38 ± 2.76	17.50 ± 2.44	17.81*	1 < 2 < 3

YSR = Youth self-report, *FAD* = Family assessment device, *PBI* = Parental bonding instrument, α = Cronbach's alpha

* $p < 0.001$

[a] Table includes results of univariate probes for two MANOVAs grouped by adolescent behavior problems and family factors (family functioning and parent–child bonding)

[b] Follow-up pairwise comparisons (Scheffé's tests)

The Differences in Family Functioning and Parent–Child Bonding

Table 1 shows the Cronbach's alphas and mean ± standard deviation on the FAD and PBI measures. The internal consistency coefficients were adequate. MANOVA revealed significant group differences (Wilks' $\Lambda = 0.66$, $F = 14.53$, $p < 0.001$). Follow-up univariate analyses indicated group differences on Family Functioning and all parental behavior subscales of the PBI (Table 1.) with moderate to large effect sizes (η^2 ranged from 0.068 to 0.195). The findings suggest that levels of problems in Family Functioning, maternal control and paternal control were significantly higher in the Full PTSD group than the Partial PTSD, and also significantly higher in the Partial PTSD than the No PTSD group. Pairwise comparisons revealed that the Full PTSD group scored significanly lower on Maternal care than the Partial and No PTSD groups, but the Partial and No PTSD groups did not differ from one another. For Parental Care, pairwise comparisons showed the Partial PTSD and Full PTSD groups scored significantly lower than No PTSD group, but the Partial and Full PTSD groups did not differ from each other.

The Relationship Between Adolescent Emotional (Internalizing) and Behavioral (Externalizing) Problems, and Family Functioning and Parenting

Family functioning, Maternal control, and Parental care and Paternal control did not explain a significant proportion of the variance in adolescent internalizing and externalizing problems. Maternal care was the only effective predictor variable for internalizing ($\beta = -0.992$, $p < 0.01$) and externalizing problems ($\beta = -0.492$, $p < 0.01$). The explained variance for the entire model of internalizing problems was 14 % and of externalizing problems was 12 %. The results of the multiple stepwise regression analysis

indicate that adolescent internalizing and externalizing problems increased with lower levels of maternal care.

Discussion

To the best of our knowledge, this is the first study examining self-reported mental health problems, family functioning and parent–adolescent bonding among adolescent offspring of male war veterans with partial PTSD in the outpatient psychiatric treatment. Findings from this investigation suggest that mental health problems, family and parental functioning vary according to PTSD group among outpatient adolescent offspring of male war veterans.

Outpatient adolescent offspring of male veterans with partial PTSD reported levels of emotional and behavioral problems similar to adolescent offspring of veterans with full PTSD, who in turn reported significantly higher levels of total behavior problems. Previous studies have found that community and referred offspring of male veterans with full PTSD were about two times more likely to report clinically significant internalizing and externalizing problems in comparison with non-PTSD veteran counterparts (Jordan et al. 1992; Boričević Maršanić et al. 2014a). A consequence of reliance on the categorical model of psychiatric disorders, however, is that relatively little attention has been paid to secondary traumatization in offspring of male veterans with PTSD symptoms that fall short of meeting full criteria. Our data are in line with existing research on traumatic stress and PTSD that has identified a link between parental mental health and children's functioning (Weems and Overstreet 2008), and suggest that partial combat-related PTSD might play a role in the development and maintenance of psychopathology in outpatient adolescent children of male veterans. Thus, clinicians should be attentive to mental health problems among outpatient adolescent offspring of male veterans with subsyndromal PTSD and provide interventions targeting both emotional and behavioral problems.

With regard to family functioning, adolescent offspring of veterans with full PTSD reported the highest levels, the partial PTSD group intermediate levels and the No PTSD group the lowest levels of problems in functioning of the whole family. These findings are consistent with the majority of studies examining family functioning in veterans' families (Jordan et al. 1992; Davidson and Mellor 2001). Davidson and Mellor (2001) found that the lowest levels of family functioning were reported by children of Vietnam veterans with PTSD in comparison to children of veterans without PTSD and a control group of children whose parents did not take part in combat. Stein et al. (1997) reported that persons with full and partial PTSD reported comparable levels of interference in family functioning. Our findings suggest that impairment in overall family functioning increases with increase in number of PTSD symptoms. However, family dysfunction was not associated with either internalizing or externalizing problems of adolescent offspirng of male veterans with partial PTSD in this study. Although family dysfunction has been found to increase the risk of a wide variety of emotional and behavioral problems in children and adolescents (Stein et al. 2000; Tamplin et al. 1998), it may be that in families of male veterans with partial PTSD it did not reach point to negatively influence adolescent development. However, the possibility remains that family dysfunction may negatively affect parental behavior of veterans with partial PTSD and their spouses.

Regarding parental bonding, levels of paternal care in the partial PTSD group of adolescents were similar to the Full PTSD group, while paternal control was highest in the Full PTSD group, intermediate in the partial PTSD group and lowest in the No PTSD group.

Research indicates that the emotional numbing, detachment, and avoidance in a course of PTSD secondary to combat exposure most highly correlated with diminished father's ability to engage the child in the level of normal interactions required to develop a meaningful relationship (Ruscio et al. 2002; Cohen et al. 2011). Moreover, veterans with PTSD are much more likely to report controlling, overprotective and demanding relationships with their children than veterans without PTSD (Jordan et al. 1992; Harkness 1993).

Levels of maternal control were higher in the Partial PTSD group compared to the No PTSD group, although they did not reach levels of the Full PTSD group. Therefore, our results demonstrate that not only male veterans with partial PTSD have difficulties in parenting, but that their spouses also show adverse parenting practices. There is much literature describing the personal and marital distress these wives experience as a result of such an ongoing stressful situation (Dekel and Solomon 2006; Franciškovic et al. 2007). Future research will be required to explore the determinants of impaired parenting in male veterans with partial PTSD and, in particular their spouses, including the roles of specific mental disturbances.

Next, our findings indicate that higher levels of emotional and behavioral symptoms in adolescent offspirng of male veterans with partial PTSD were associated with lower levels of maternal care. Although the present study design does not allow firm conclusions regarding causality to be drawn, it is possible that poor family relationships, in particular, low levels of maternal care may lead to the development of psychological symptoms in adolescents and that poor maternal parenting may play a stronger role in predicting adolescent mental health problems than poor paternal parenting. The association between the lack of maternal care and emotional and behavioral problems has been demonstrated in clinical and population-based studies of young people (Freudenstein et al. 2011; Weich et al. 2009). Spouses of male veterans with partial PTSD may take over full responsibility for the welfare of the children compensating for their husband's impaired family functioning similar to the wives of veterans with full PTSD (Dekel et al. 2005), and therefore maternal parenting behavior may affect their adolescent children more. Alternatively, it could be that adolescent children of male veterans with partial PTSD are more vulnerable to deficits in maternal parenting than paternal parenting. However, other plausible explanations should be prominently considered also. First, the possibility remains that parenting in families of male veterans with partial PTSD might deteriorate as a consequence of adolescent behavior problems. Second, it is equally plausible that in families of male veterans with partial PTSD poor parenting and child psychopathology co-occur because of shared genetic vulnerabilities within families. Thus, the influence of father's partial war-related PTSD on their adolescent offspring negative behavioral outcome is most likely to be complex, reflecting both heritable vulnerability to mental illness and multiple effects on childhood environment. Future longitudinal investigations are needed to provide evidence of a causal link among parenting and adolescent emotional and behavioral problems in families of male war veterans with partial PTSD, and examine a mediating role of maternal psychopathology in the relation between father's combat-related PTSD and children's functioning.

The present findings are relevant to clinicians treating outpatient adolescent offspring of male veterans with partial PTSD. They underscore the need to plan interventions to promote effective parenting in families of male veterans with partial PTSD. Yet there has been little systematic development of interventions addressing these issues. Empirically based parenting skills programmes targeting specific trauma-related difficulties, such as regulating negative emotion and managing interpersonal conflict, are currently not available.

More development and incorporation of trauma-specific interventions are needed to help parents understand how their traumatic experiences can negatively affect attitudes and behaviors, and to build a repertoire of alternative parenting strategies. On the other hand, the results of intervention studies suggest that parenting practices may be malleable, and that intervening to promote effective parenting results in improvements in children's externalizing and internalizing problems (Gewirtz et al. 2008).

According to our results, it may be also useful to design prevention programs focused on the parent population, in particular spouses of male veterans with partial combat-related PTSD, instead or in addition to the adolescent or preadolescent population. These programs should discuss issues of control, overprotection, and independence, as well as issues of closeness, affection, and empathy in the parent–child relationship.

Limitations

The findings in this study should be considered preliminary and interpreted in the context of its limitations. First, the overall interpretation of our results is limited because of the cross-sectional design of the study. A possible causal relationship can be investigated only in a longitudinally designed study. Second, data are based on adolescent self-reports and were not proofed by using other sources. Future studies may benefit from alternate perspectives and the inclusion of different reporters (i.e., parent or clinician report). Third, the study sample is composed of outpatient adolescent offspring of male veterans with no, partial or full combat-related PTSD from intact families and not truly representative of the offspring population of veteran fathers with PTSD. Although it is important to gather information on this high-risk group, generalizability of findings may be limited. Also affecting generalizability is the inclusion criterion of having a child in the 12–18 age range. Therefore additional research with community-based and clinical samples will be necessary to determine if our results generalize to those from other family structures, cultural and socioeconomic backgrounds and treatment settings. Another potentially important limitation is our exclusive focus on PTSD without regard to comorbidity. Future studies will need to document the presence of comorbid conditions and, to the extent possible, ascertain whether offspring psychopatology and impaired family relationships are directly attributable to PTSD symptoms or to the comorbid condition(s).

Conclusion

The results of this study further our understanding of the mental health, family functioning and parenting practices in families of male veterans with partial combat-related PTSD with adolescent children referred to outpatient psychiatric treatment. Hypotheses were partially supported. Levels of problems in adolescent mental health, family functioning and parenting were comparable to the full PTSD group. Higher levels of symptoms in outpatient adolescent offspirng of male veterans with partial PTSD were more closely related to poor maternal than paternal parenting. Given the broad public health implications of these findings, more efforts are needed to identify mental health problems in adolescent offspring of male veterans with partial PTSD and impaired family relationships in their families, and provide interventions targeting both adolescent psychopathology and family relationships. Future studies in this area should attempt to control for the effects of comorbid psychopathology to assess a unique contribution of partial PTSD to the poor family functioning,

parenting and outcomes seen in the veterans' children. Additional covariates, such as combat exposure, genetic contribution, maternal psychopathology, domestic violence, etc., should also be taken into account in a systematic fashion.

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