Author's response to reviews

Title: 'Pseudoneurological' symptoms, dissociation and stress-related psychopathology in healthy young adults

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Author's response to reviews
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Title: 'Pseudoneurological' symptoms, dissociation and stress-related psychopathology in healthy young adults

Authors:
Petr Bob, Petra Selesova, Jiri Raboch and Lubomir Kukla

Version: 1 Date: March 18, 2013

Author's response to reviews: see over
Referee 1:
Reviewer's report
Title: Somatoform dissociation, 'pseudoneurological' symptoms and stress-related psychopathology in healthy adolescent population
Version: 1 Date: 27 November 2012

Reviewer: Doris K Nilsson

Reviewer's report:

This piece of research could be interesting but the manuscript is all over a little bit careless written and untidy. It need to be re-worked. The method section need to be taken care of and re written.

The manuscript has been re-worked and corrected

Abstract- the conclusion section is unclearly written

The conclusion section has been corrected

Minor corrections Page 4 first paragraph need to be carefully read as there are some typos that are odd and need to be corrected.

The p.4 first paragraph has been corrected

Minor Page 4 second paragraph it should be clarified which countries participated in the study not only a description of few.

The p.4 second paragraph has been corrected

Same page mean age also SD should be added.

The p.4 SD has been added

Major corrections: Method
Page 5 Procedure are not adequately described There is also no description how and where data were collected in hospital or at home ??? Need to be described. who collected the data ?

The p.5 has been corrected and additional information included

Major corrections Page 5 the whole section here concerning the instruments need to be better described and translations, year of translation and how well the instruments have shown to be concerning reliability and validity. In the Czech Republic and with references . First on top how was SDQ translated- there is now reference at all to translation nor to how and where- which study who had presented internal consistency. Validity need to be presented. Also the description of TSC-40 is not enough for ex the authors write “symptom cluster” which symptom culsters? Need to be explained. The authors present reliability measures without any reference. Also validity is necessary and reference .BDI Cezch version but with no references to any studies

The p.5 has been corrected and additional information included.
Limitations are not stated at all and need to be done

The limitations have been added into the conclusion section

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

The language corrections have been made

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests

Referee 2:

Reviewer's report

Title: Somatoform dissociation, 'pseudoneurological' symptoms and stress-related psychopathology in healthy adolescent population

Version: 1 Date: 11 January 2013

Reviewer: Eva Mazzotti

Reviewer's report:

Major Compulsory Revisions

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

The language correction has been made

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests

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Additional material submitted by the reviewers

Referee 2:

Title: Somatoform dissociation, ‘pseudo neurological’ symptoms and stress-related psychopathology in healthy adolescent population.

Authors: Bob P, Selesova P, Raboch J, Kukla L.

Comments:

The paper addresses an interesting issue about relationship between somatoform dissociation and traumatic or stressful experiences in adolescents. But I noted several major conceptual and methodological problems that compromise the quality of the paper. In my opinion this article is not acceptable for publication in its current form. However, because the topic and data is of significant interest for the field, I would like to suggest the Authors to prepare a revised manuscript with substantial corrections.

In particular the introduction section is vague, with generalizations about SD and do not present the current status of the literature (data, debate, etc.). Many recent findings are missing and the references are not updated. The aims of the study are also vague. Curiously, authors prepared a paper on SD in healthy adolescent population and did not report any studies on SD in young people. For example, there is a recent study on SD among 1000 students (Farina et al. J Clin Psychol, 2011 Jul; 67(7):665-672. DOI: 10.1002/jclp.20787). Other studies are useful to compare means, medians etc. in comparable population. More, the Authors asked about pain and, for example, did not report another recent study on Somatoform and Psychoform dissociation among women with orgasmic and sexual pain disorders (Farina et al. Journal of Trauma and Dissociation 2011, 12, 526-534 DOI: 10.1080/15299732.2011.598124).

The literature review in the introductory part was extended and recommended citations included.

Details

Page 1

Title

Somatoform dissociation AND pseudoneurological symptoms appeared redundant.
It not convinced me the label ‘adolescent’: the mean age is 18.6, there is not standard deviation, neither minimum and maximum. A generic ‘young’ can be better.

The title correction has been made

Page 2

Abstract

Background

Please, clarify the meaning of the second phrase “With respect to the distinction between psychological and somatoform dissociation current data suggest a hypothesis to which extent mild manifestations of ‘pseudoneurological’ symptoms of somatoform dissociation in healthy population may be attributed to stress-related psychopathological symptoms or whether these symptoms could more likely be attributed to unexplained somatic factors.”

The second phrase has been corrected

Results

“Results of this study indicate that the symptoms of somatoform dissociation are significantly linked to stress-related psychopathology indicating that also mild levels of stress may influence somatic feelings and may lead to various somatoform symptoms.”. This is not a result, is an interpretation.

The results section has been corrected

Conclusions

Conclusions are too vague

The conclusion section has been corrected

Main text

Introduction

Page 3

In the last paragraph, “in healthy population” can be changed into “general population”, and “attributed to” can be changed into “assimilated to” .

The corrections have been done

Page 4
Participants

“healthy adolescents, who present” must be corrected as “healthy adolescents, who represent”. How the 250 have been selected? How many time before medical and psychiatric evaluation has been done? Which is standard deviation for age, and minimum and maximum?

“Data characterizing participant’s somatoform dissociation and other psychopathological manifestations related to symptoms of traumatic stress, depression, anxiety and alexithymia were assessed” can be removed.

The corrections have been done and available information added.

Page 5

All the instruments are “self-report questionnaire”, so the authors can insert a phrase at the beginning, on page 4, and remove the repetitions in the text. Have been the instruments’ reliability measures previously assessed and published? If yes, insert the references. If no, specify “in this study, Cronbach’s alpha is ....” Better “after one week” than “after week” (line 3, line 9, line 12, line 15). Please report score minimum and maximum for each instrument, can support the readers (i.e.: SDQ-20: Items are summed to provide a total score (range 20–100). TSC-40: Items are summed to provide a total score (range 0–120), etc).

The corrections have been done and available information added.

As well known, TSC-40 is a questionnaire consisting of six subscales: Anxiety, Depression, Dissociation, Sexual Abuse Trauma Index (SATI), Sexual Problems, and Sleep Disturbance, as well as a total score. I think that of great interest will be to investigate the differences in the relationship between SD’s symptoms and each TSC-40 subscale, while the relationship between SD’s symptoms and the TSC-40 total score is expected. The same observation for the TAS-20.

The additional analysis has been made without statistically significant differences. Details are in the Results section.

Statistical methods

For descriptive purposes calculate, and reported they in the Table, medians and inter quartile ranges. Owing to non normality of the SDQ-20 score distribution, the Authors categorized participants respect SDQ-20 median value. The Authors are interested to study the association between the presence of the condition investigated (binary outcome) and some independent factors (covariates). Crude and adjusted Odds Ratios (O.R.) with 95% confidence intervals (CI) appear more appropriate to study the association between selected variables and the propensity to somatoform dissociation. I also suggest to Authors to calculate SDQ-20 categories according to its quartile scores. For example, the first category (SDQ-20 score = 0) can be used as reference, the second (21–23) can be labeled “mild pseudoneurological symptoms”, the third (24–?), “moderate pseudoneurological symptoms” and the fourth (n-n), “severe pseudoneurological symptoms”.

The additional statistical analysis reflecting recommendations and their purpose has been done and is included in the Results section and one additional table has been added. The division has been made according to quartile score and processed using Kruskal-Wallis ANOVA
that for multiple comparisons is suitable with respect to the purpose to verify continuous changes and verify non-parametric correlation analysis.

Results

Move the first phrase in Method section.

The phrase has been corrected.

Table 1

As shown in Table 1, there are differences in depression score, as measured by BDI-II, in anxiety symptoms score, as measured by SAS, in alexithymia score, as measured by TAS-20, in trauma symptoms, as measured by TSC-40, between participants that reported none or 1 symptom in SDQ20 and those that reported two or more SDQ20 symptoms. I will be astonished if no differences in SDQ20 mean scores have been found (Table 1, line 3).

In fact because median SDQ-20 is 22 then into the first subgroup lower than median were included participants with just one symptom (scored on the scale by 2) which produces total score 21. The second subgroup with score higher (or equal) than median (i.e. subgroup with Mean higher≥22; N=120) scored one symptom or more but at least with the total score 22. Therefore the using median split clearly discriminate between participants who scored just one symptom with lowest possible score. The analysis is included in the test.

I have several questions. Why you report p-values as greater than (> ) 0.001 (Table 1, column 5)–but minor of 0.05, I suppose– rather that the exact values? Why you use as header “Mean lower” and “Mean higher” (Table 1, line 1)? What did you mean? SDQ-20 lower than 22 and SDQ-20 higher than 21?

As for the p values now in the table are exact values and the level 0.05 was used as a criterion for power analysis (standardized effect size). As for the questions, yes, the text has been corrected to become more clear. Mean higher means the subgroup according to median split described above (but to use in the table SDQ-20 higher or lower would be misleading).

In the following text all described changes were highlighted (the new tables are attached):

Abstract

Background: Somatoform dissociation is a specific form of dissociation with somatic manifestations represented in the form of ‘pseudoneurological’ symptoms due to disturbances or alterations of normal integrated functions of consciousness, memory or identity mainly related to trauma and other psychological stressors. With respect to the distinction between psychological and somatoform manifestations of dissociation current data suggest a hypothesis to which extent mild manifestations of ‘pseudoneurological’ symptoms in healthy young population may be linked to stress-related psychopathological symptoms or whether these symptoms more likely could be attributed to unexplained somatic factors.
Methods: With this aim we have assessed the relationship between somatoform dissociation and stress-related psychopathology (i.e. anxiety, depression, symptoms of traumatic stress, alexithymia) in a group of 250 healthy non-psychiatric and non-clinical young adults.

Results: Results of this study show that the symptoms of somatoform dissociation are significantly linked to stress-related psychopathology.

Conclusions: Findings of this study confirm that the ‘pseudoneurological’ symptoms may be linked to stress-related psychopathological processes which indicate that also mild levels of stress may influence somatic feelings and may lead to various somatoform dissociative symptoms.

Introduction

Somatoform dissociation has been proposed as a concept describing specific forms of dissociative symptoms experienced as somatic disturbances due to alterations of normal integrative functions of consciousness, memory or identity related to stressful experiences [1-4]. Frequently these stressors are linked to an exposition of a trauma in childhood and related to physical, sexual or emotional abuse [5-8]. The somatic manifestations of dissociation are likely caused by a lack of integration of somatoform components of experience, reactions and functions and represented by various forms of pseudoneurological symptoms [8-11] involving bodily functions such as motor inhibition or loss of motor control, gastrointestinal symptoms, dissociative seizures, painful symptoms, alterations in perception or alterations in sensation of pain (analgesia, kinesthetic anesthesia) such as inability to register pain or painful affect during traumatic event [12-14]. Several studies have shown that the concept of somatoform dissociation may explain various somatic disturbances in psychiatric patients and also in patients with pain disorders that in many cases have unexplained etiology and in principle it could be related to stress exposure and related processes of mental disintegration [2,4,6, 8-10, 14]. As expected from the psychological theory and clinical data several findings also show that symptoms of somatoform dissociation have close relationship to psychologically experienced dissociative symptoms [6]. For example a recent study of young population of students strongly suggests that various stress factors related to dissociation may have direct and continuous relationship to somatic symptoms that may be explained within the concept of somatoform dissociation [15].

Although the concept of somatoform dissociation seems to be clinically relevant, the distinction between psychological and somatic forms of dissociation represents a fundamental problem whether dissociative symptoms, reflecting disorders of conscious awareness, are always “psychological” in nature or they may have somatic manifestations mediated by somatization or conversion mechanisms [6-8]. With respect to brain-mind reductionism that rejects mental causation the problem whether stress and traumatic experiences may cause only psychological or also somatic symptoms is still controversial [2,5,9,12]. This discussion in principle suggests clinically relevant empirical question and hypothesis whether mild manifestations of pseudoneurological symptoms linked to the concept of somatoform dissociation in general population may be
attributed to stress-related psychopathological symptoms. Within this context, in somatically healthy people these symptoms likely cannot be explained by various underlying somatic factors.

With the aim to test the hypothesis we have assessed the relationship between ‘pseudoneurological’ symptoms represented by somatoform dissociation questionnaire, and stress-related psychopathological symptoms (i.e. anxiety, depression, symptoms of traumatic stress, alexithymia) in a group of 250 non-psychiatric and non-clinical healthy young adults, who represent population particularly vulnerable to stress influences.

Materials and methods

Participants

Participants of this study were selected within the framework of European Longitudinal Study of Parenthood and Childhood (ELSPAC). The longitudinal study started in 1992 and included few European countries, and was organized in the UK and Czech Republic. Cohort of the study was selected randomly in the population of the city of Brno in the Czech Republic based on voluntary agreement provided by parents awaiting a newborn child. In the present study, as a part of ELSPAC, data of 250 non-psychiatric and non-clinical healthy young adults were collected. Based on anamnestic data exclusion criteria in this study were presence of psychiatric, neurological, internal and other somatic disorders. The participants were 101 men and 149 women (mean age 18.6 years old with high school education, age range within one year, more than 18 less than 19). Data characterizing participant’s somatoform dissociation and other psychopathological manifestations related to symptoms of traumatic stress, depression, anxiety and alexithymia were acquired. All the participants gave written informed consent and the study was approved by Masaryk university ethical committee. All the data used in the study were acquired at the Institute of Preventive and Social Pediatrics, Faculty of Medicine, Masaryk University, Brno and data acquisition and processing were done by mental health professionals at the Institute.

Psychometric measures

Somatoform dissociative symptoms were assessed using the 20-item self-reported somatoform dissociation questionnaire SDQ-20 [9]. Somatoform dissociative symptoms represent alterations in sensations of pain (analgesia, kinesthetic anesthesia), alterations of perception, loss of motor control, gastrointestinal symptoms, etc. Subjects indicate the degree of their experience on 5-point Likert scale (total score from 20 to 100). In the study we have used the Czech version of the SDQ-20 that displays high reliability and internal consistency (Cronbach’s alpha 0.91, test-retest reliability after one week 0.90).

For investigation of childhood traumas, TSC-40 (Trauma Symptom Checklist) [16] was used. TSC-40 is a self-reported 40-item questionnaire done on a 4-point Likert scale (total score from 0 to 120). TSC-40 evaluates symptomatology in adult individuals associated with childhood or adult traumatic experiences and measures aspects of posttraumatic stress and other symptom clusters found in some traumatized individuals represented by subscales for dissociation, anxiety, depression, sexual abuse trauma index (SATI), sleep disturbances and
sexual problems. The Czech version of the TSC-40 has high reliability and internal consistency (Cronbach’s alpha 0.91, test-retest reliability after one week 0.88).

For the assessment of depressive symptoms Czech version of Beck depression inventory BDI-II [17] was used that represents 21-items questionnaire for assessing depression (Cronbach’s alpha 0.89, test-retest reliability after one week 0.85). Subjects indicate degree of their experience of depressive symptoms on 4-point Likert scale (total score from 0 to 66).

Levels of anxiety symptoms were assessed using the Czech version of the Zung Self-Rating Anxiety Scale (SAS) (Cronbach’s alpha 0.89, test-retest reliability after week 0.85) [18]. The SAS is 20-item self-reporting questionnaire focused on the most common general anxiety symptoms. Each question is scored on 4-point Likert scale from 1 to 4 (total score from 20 to 80).

Alexithymia was assessed using the Czech version of the 20-item Toronto Alexithymia Scale (TAS-20) (Cronbach’s alpha 0.81, test-retest reliability after 1 week 0.77) [19]. Each question is scored on a five-point Likert scale from 1 to 5 (total score from 20 to 100).

The Czech versions of the all questionnaires were originally created in 2005 by translation from the English original and then back-translated into English and the resulting document was compared with the original by a native English speaker. The Czech version were then tested on a sample of 400 persons selected from general population and on samples of psychiatric and neurological patients, and results using these tests were published [20-22].

Statistical methods

Statistical evaluation for the results of SDQ-20 and other psychometric measures included descriptive statistics, Mann-Whitney test for independent samples, Kruskal-Wallis ANOVA, Spearman correlation coefficients and multiple linear regression analysis. The non-parametric analyses were preferred because SDQ-20 data have not normal distribution. All the methods of statistical evaluation were performed using the software package Statistica version 6. To prevent Type II error which would disable to reject null hypothesis that symptoms of somatoform dissociation are not linked to stress-related psychopathological symptoms we performed Power Analysis and assessed the effect sizes characterizing differences between means of the subsamples with higher and lower levels of somatoform dissociative symptoms.

Results

To test psychopathological symptoms with respect to occurrence of pseudoneurological symptoms related to somatoform dissociation we have used descriptive statistics for the whole sample (N=250; Table 1) and then the participants were divided into two groups according to values of SDQ-20, i.e. higher (N1 = 130; SDQ-20 ≥ 22) and lower (N2=120; SDQ-20 < 22) than median. Based on this separation the results of the Mann-Whitney test show that the participants with higher level of symptoms of somatoform dissociation (SDQ-20) than median display increased level of symptoms of traumatic stress (TSC-40), depression BDI-II, anxiety (SAS).
and alexithymia (TAS-20) in comparison to participants who have lower SDQ-20 score than median (Table 2). In the power analysis we have tested significant differences between means which show that with exception of TAS-20 with medium effect size ($r \geq 0.3$) all differences between means had strong effect size ($r \geq 0.5$; Table 2). The results also indicate that SDQ-20 is significantly correlated to TSC-40 (Spearman $r=0.545$, $p<0.01$), BDI-II (Spearman $r=0.419$, $p<0.01$), SAS (Spearman $r=0.471$, $p<0.01$) and TAS-20 (Spearman $r=0.307$, $p<0.01$). These correlations show that SDQ-20 pseudoneurological symptoms exhibit significant and proportional relationship to symptoms of traumatic stress, depression, anxiety and alexithymia. In the analysis we have not found specific relationships between SDQ-20 and the subscales of the TSC-40 and TAS-20. All correlations between SDQ-20 and the subscales were statistically significant but did not show statistically significant differences between the correlation coefficients.

To confirm and further analyze results obtained by correlation analysis we have divided the whole sample according to SDQ-20 score with respect to interquartile range (Table 1) into 4 subgroups 1\textsuperscript{st} from 20 to 25; 2\textsuperscript{nd} from 25 to 30; 3\textsuperscript{rd} from 30 to 35; and 4\textsuperscript{th} including all SDQ-20 scores from 36. To analyze differences in TSC-40, BDI-II, TAS-20 and SAS between the subgroups defined according to SDQ-20 subgroups we have used Kruskal-Wallis ANOVA. The results show that increased SDQ-20 scores in these subgroups are significantly linked to increased values of psychopathological symptoms measured by TSC-40, BDI-II, TAS-20 and SAS ($z>5.9$; $p<0.00000001$; $H>21.8$) which indicate that increased values of somatiform symptoms are related to continuously increased psychopathological symptoms.

To effects of TSC-40, BDI-II, TAS-20 and SAS on SDQ-20, we have used a multiple linear regression that may be useful to know whether stress-related psychopathological symptoms in their specific interactions are proportionally linked to increased levels of SDQ-20. The result shows that multiple $R = 0.60$ is statistically significant ($p<0.01$; $F=34.44$) which enables to define SDQ-20 as a linear function of four variables $SDQ-20=f(TSC-40, BDI-II, TAS-20, SAS)$.

Table 1. New Table
Table 2. Aditional data

Discussion

Results of this study show that the ‘pseudoneurological’ symptoms described in the context of somatofrom dissociation are significantly and proportionally associated with stress-related psychopathology and that also relatively mild stressors may be linked to somatic manifestations. A limitation of this study may be occurrence of “medically unexplained symptoms” [23] that may manifest in general population and in principle these symptoms may also have other explanations than somatic form of dissociation and statistically may influence the results. Nevertheless with respect to the hypothesis findings of this study show that the “pseudoneurological” symptoms likely at least in part have psychological origin and can be explained by dissociative mechanisms in
their somatic form within the framework of somatoform dissociation. Although some somatic factors influencing the symptoms cannot be rejected, predominant influence on these pseudoneurological symptoms likely may be linked to stress. Important aspect of this association presents the relationship between the pseudoneurological symptoms and alexithymia suggesting that loss of inner ability to distinguish, experience and interpret internal emotional states and feelings typical for alexithymia [19] is linked to the process of disordered conscious awareness related to the process of dissociation in its somatic form [6,24].

In addition, dissociated mental states have sensory, emotional and cognitive elements that may be misinterpreted and experienced as physical, and due to this misinterpretation physical and emotional experience can become confused and one of them may turn into the other [8]. For example, localized pain may depend on the reactivation of a previously dissociated traumatic memory linked to sensorimotor responses during the past traumatic experience which caused a lack of integration of somatoform experiences, reactions and functions [6].

This influence of stress and dissociation on somatic experience and bodily functions is in agreement with growing evidence that for example orbital prefrontal areas regulate affect, motivation, and bodily state and that early relational traumatic stress is specifically imprinted into the right brain, which is dominant for autobiographical memories [25]. Those and other scientific findings show that the mind–brain mechanisms present complex network, in which the brain is linked to the dynamics and entity called ‘mind’ that mediates subjective mental experience [26,27].

In this context, results of this study indicate that also mild levels of stress in the mind of healthy people may be linked to somatic pseudoneurological symptoms and that somatoform dissociation may present important mediating factor which may explain relationship between mental stress and somatic symptoms. Results of the present study together with other reported findings strongly suggest that clear diagnostic distinction based on available evidence about somatoform dissociation presents an important issue for clinical practice. Mainly these research findings could be useful for description and classification of diseases that in their current forms (ICD-10, DSM IV) only partially take into account influences of mental states on somatic functions and symptoms. A detailed analysis which somatic symptoms might be with high probability attributed to somatoform dissociation likely would have high clinical impact for differential diagnostics and could provide useful diagnostic instrument.