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## Association between social support and temperament and the intensity of PTSD symptoms in a sample of HIV positives

**Abstract:** The aim of this study was to investigate the association between temperament and social support and the level of quantitatively rated PTSD symptoms in a sample of HIV+ and HIV/AIDS men and women. A total of 310 men and women, including 182 HIV+ and 128 HIV/AIDS, were studied. Social support was assessed with the Berlin Social Support Scales (BSSS). Temperament was assessed with the Formal Characteristics of Behaviour – Temperament Inventory (FCB-TI). Intensity of PTSD symptoms was assessed with the PTSDF (PTSD Factorial Version inventory). The best predictors of intensity of PTSD symptoms in HIV+ participants were support seeking and sensory sensitivity. Support seeking was positively associated, and sensory sensitivity was negatively associated with intensity of PTSD symptoms.

**Key words:** social support, temperament, PTSD, HIV/AIDS.

### Introduction

The main goal of this study was to investigate the association between social support and the level of quantitatively rated PTSD symptoms in a sample of HIV+ and HIV/AIDS men and women. It also focused on the relationship between temperament and social support in order to examine if particular temperament traits can moderate the relationship between social support and the intensity of PTSD symptoms in the sample of HIV+ positives. HIV+ and HIV/AIDS groups develop PTSD symptoms largely in response to being diagnosed as having a lethal virus in their body (Beckerman & Auerbach, 2010; Martin & Kagee, 2011) and also because the course of HIV/AIDS is unpredictable and treatment is troublesome (Safren, Gershuny & Hendriksen, 2003; Theuninck, Lake & Gibson, 2010). Social stigmatisation which significantly disrupts the existing social status of HIV+ individuals is an additional contributing factor. Although disclosure of HIV infection may evoke considerable social support, more often than not it leads to rejection and discrimination, especially when the infected individual has many symptoms of HIV

infection (Adewuya et al., 2009; Chin & Kroesen, 1999; Heckman et al., 2004; Shacham et al., 2007). Stigmatisation and social isolation sever patients' family bonds, leading to withdrawal of support by family members (Dawey, Foster, Milton & Duncan, 2009; Li et al., 2008). Family support is important for perceived available support in patients and for their mood (Abramowitz, Koenig, Chandwani et al., 2009; Lee, Detels, Rotheram-Borus, Duan & Lord, 2007). It can also boost coping skills and improve general psychosocial functioning in HIV+ individuals (Peterson, Rintamaki, Brashers, Goldsmith & Neidig, 2001). Lack of social support can aggravate psychological distress (Delany-Brumsey, Joseph, Myers, Ullman & Wyatt, 2011), increase the temptation to discontinue pharmacotherapy, and intensify HIV-related symptoms such as PTSD, anxiety, depression or fatigue (Barroso et al., 2010; MacDonell, Naar-King, Murphy, Parsons & Huszti, 2011). Researchers have demonstrated that a ramified social support system can protect from the proliferation of depressive symptoms in HIV+ individuals (Jagannath et al., 2011). On the other hand, support seeking is an important motive behind willingness to disclose the fact that one is HIV-positive (Ssali et al.,

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2010), despite accompanying apprehensions (Emlet, 2006). Social support has also been found to significantly attenuate intensification of HIV symptoms (Ashton et al., 2005) and improve quality of life in infected individuals (Hansen, Vaughan, Cavanaugh, Connell, & Sikkema, 2009). In the present study we assumed that social support can moderate the intensity of HIV-related PTSD symptoms, i.e. it can protect HIV-positive individuals from intensification of post-traumatic symptoms. It also facilitates active coping and helps to reduce the sense of loss of control (Dekel, Mandl, & Solomon, 2011; Frazier, Gavian, & Hirai, 2011).

The temperament traits postulated by the Regulatory Theory of Temperament (RTT; Strelau, 2008) were the second group of variables in our study. According to the RTT, temperament traits are basic, relatively stable personality traits which manifest themselves in all behaviours and situations in which people are involved, especially when in a state of extreme arousal. The reason why these traits are important is that temperament is present from the moment we are born and the related biological mechanisms cooperate in the regulation of individual level of activation. The role of personality traits in the dynamics of PTSD is still poorly understood. As far as HIV-related trauma is concerned, researchers have found that personality traits may be associated with risky behaviour leading to HIV infection (Moore, Atkinson, Akiskal, Gonzalez, & Wolfson, 2005). They may also affect the dynamics of the disease itself and speed of recovery (Erlen et al., 2009) and affect patients' quality of life (Penedo et al., 2003). PTSD symptoms are significantly enhanced by neuroticism and introversion (Jorm et al., 2000; LaFauci Schutt & Marotta, 2011; Watson, Gamez, & Simms, 2005; Zhang, Liu, Shi, & Cheng, 2010, conscientiousness (O'Leirigh, Ironson, Weiss, & Costa, 2007) and the temperament and character dimensions proposed by Cloninger (Evren, Dalbudak, Cetin, Durkaya, & Evren, 2010; Fassino, Leombruni, Amianto, & Abbate-Daga, 2004; Yoon, Jun, An, Kang, & Jun, 2009). All these factors correlate with the temperament traits we looked at in the present study (Hornowska, 2003).

In this study we were interested mainly in the association between social support and the level of quantitatively rated PTSD symptoms in a sample of HIV+ and HIV/AIDS men and women. We were also focused on the relationship between social support and temperament in order to examine if particular temperament traits can moderate the relationship between social support and the intensity of PTSD symptoms in the sample of HIV+ and HIV/AIDS positives. We based our assessment of PTSD symptoms on the theoretical PTSD construct and its basic symptoms according to the DSM-IV diagnostic criteria: intrusion, avoidance/numbing and hyperarousal (APA, 1994).

## Method

### Participants

The sample included 310 adults (157 men and 153 women) with clinically diagnosed HIV infection aged from 19 to 68 ( $M=37.38$ ;  $SD=9.69$ ). In the whole sample

182 participants were HIV+ (the HIV+ group) and 128 participants had AIDS (the HIV/AIDS group). Duration of HIV infection in the whole sample ranged from one year to 29 years ( $M=7.44$ ;  $SD=6.20$ ); 123 participants had higher education (39.7%), 140 had secondary education (45.2%) and 47 had primary education (15.2%). No cognitive dysfunction impeding psychological assessment was observed. Participants were not remunerated. The research project was accepted by the local Research Ethics Committee at the Faculty of Psychology, University of Warsaw.

### Measures

Intensity of PTSD symptoms was measured with the PTSDF, a factor-analysis-derived questionnaire. This questionnaire has two scales: Intrusion/Arousal (Cronbach  $\alpha$  0.96) and Avoidance/Numbing (Cronbach  $\alpha$  0.92). A Global Score can also be computed by adding scores on these scales (Cronbach  $\alpha$  0.96). The PTSDF has 30 items. Each item is rated on a 4-point scale where 1 signifies symptom absence and 4 signifies that the symptom is always present. The PTSDF has been validated against other clinical constructs such as: trait anxiety, sense of coherence, mental health, distress, psychological wellbeing and a civilian version of the Mississippi PTSD (Strelau, Zawadzki, Oniszczenko, & Sobolewski, 2002).

Temperament traits were assessed with the Formal Characteristics of Behaviour – Temperament Inventory (FCB-TI; Strelau & Zawadzki, 1995). This questionnaire has 120 items, 20 items per scale and a YES or NO response format. The FCB-TI includes the following scales (Cronbach  $\alpha$  coefficients in parentheses): Briskness (speed, tempo and mobility of behaviour; 0.77), Perseveration (the tendency to maintain and repeat emotional states; 0.79), Sensory Sensitivity (the capacity to react to weak stimuli; 0.73), Emotional Reactivity (the tendency to react intensely to emotogenic stimuli; 0.83), Endurance (the capacity to react adequately in highly stimulating situations; 0.85), and Activity (the tendency to engage in behaviour which is intrinsically or extrinsically highly stimulating; 0.84). The scales have test-retest stability scores ranging from 0.69 (Briskness) to 0.90 (Activity).

In order to analyze the association between social support and PTSD symptoms intensity we used an instrument which was constructed specifically to measure social support in post-traumatic stress, the Berlin Social Support Scales (BSSS; Łuszczynska, Kowalska, Mazurkiewicz, & Schwarzer, 2006). These scales measure cognitive and behavioural aspects of social support, especially in cases of severe somatic disease. The BSSS has six scales: Perceived Available Support, Need for Support, Support Seeking, Actually Received Support (Recipient), Provided Support (Provider), and a Protective Buffering Scale – Support Provider/ Support Recipient. Only the first four scales were analyzed in this study because we were interested in subjective perception of support in HIV+ individuals. The Polish version of the BSSS has satisfactory psychometric parameters. Cronbach  $\alpha$  coefficients range from 0.74 to 0.90.

### Statistical analysis

The data were submitted to statistical analysis using the PASW Statistics 18 (SPSS, 2009). First of all, groups HIV+ and HIV/AIDS were compared for social support (means and standard deviations) using the *t* test for independent samples. Correlations between variables were calculated using the Pearson product moment or Spearman rho correlation procedures respectively. Validity of predictions of PTSD symptoms intensity based on social measures of social support and temperament traits was estimated using hierarchical regression analysis (inclusion model), where we also investigated the significance of the interactions between temperament traits (see: sensory sensitivity) and aspects of social support (see: social support seeking). We included demographic variables (see: age) as the first step in our hierarchical regression analysis. No statistical significance in the level of PTSD symptoms between HIV+ men and women was observed (see:  $t = .11$ ; n.s.), therefore gender was not put in the regression analysis.

### Results

The basic descriptive statistics for both groups and the outcomes of analyses of significance of differences between groups HIV+ and HIV/AIDS for social support are presented in Table 1. The problem of the intensity of the temperamental traits in above mentioned groups was not dealt with in this paper, as it was elaborated on in a different paper by the same authors (see: Rzeszutek, Oniszczenko, Firląg-Burkacka, 2012).

No significant differences were found for social support between HIV+ and HIV/AIDS individuals.

The outcomes of the correlation analyses for social support and intensity of PTSD symptoms and temperament traits for the whole studied sample, are presented in Table 2. (page 434).

As we can see in Table 2, support seeking, perceived available support and actually received support correlate with all the PTSD symptoms indicators. These correlations are low and positive. Sensory sensitivity, emotional reactivity and perseveration correlate weakly and negatively, and endurance correlates weakly and positively, with perceived available support only.

In order to determine the extent to which specific temperament traits and dimensions of social support can be viewed as predictors or buffers of global PTSD

symptoms score in HIV+ individuals, which was treated as the explained variable in the analysis, we conducted a hierarchical regression analysis (inclusion model). Variables which correlated most strongly with the global PTSD level (see: sensory sensitivity and social support seeking) were assumed to be potential predictors or buffers of the explained variable. We included demographic variables (see: age) as the first step in our hierarchical regression analysis so as to explore, whether above mentioned temperament traits and social support aspects contribute above and beyond the level of PTSD symptoms among the whole group HIV+ individuals, when controlling for age. The results of this analysis are presented in Table 3 (page 434).

As we can see in Table 3, positive correlations between age and the level of PTSD symptoms in the whole group of HIV+ individuals was observed. In addition to this, sensory sensitivity accounts for 14% of the variance of global PTSD symptoms in HIV+ patients and sensory sensitivity and support seeking together account for 19.5% of the variance of the explained variable among the whole group of HIV+, when controlling for age.

Finally, we wanted to investigate, whether temperament traits (see: sensory sensitivity) can moderate the relationship between social support (see: social support seeking) and the intensity of PTSD symptoms in the sample of HIV+ and HIV/AIDS positives, also when controlling age.. Explanatory variables were centered using standardization to *z* scores. The results of an analysis can be found in Table 4 (page 434).

Hierarchical regression analysis with interactive ingredient has shown a significant relationship between the level of sensory sensitivity (semipartial correlation =  $-.33$ ;  $p < .001$ ) and the level of social support seeking (semipartial correlation =  $.24$ ;  $p < .001$ ) with the intensity of PTSD symptoms in the HIV+ sample, when controlling for age. The model for the main effects of explanatory variable (see: social support seeking) and the moderator (see: sensory sensitivity) revealed good fitness to the data,  $F(3,306) = 24.69$ ;  $p < .001$ . A significant interaction effect was also revealed (semipartial correlation =  $-.09$ ;  $p < .10$ ). The model with interactive ingredient revealed good fitness to the data as well,  $F(4,305) = 19.46$ ;  $p < .001$ , and after adding interactive ingredient, 20.3% of variance of the explained variable was produced.

**Table 1. Means and standard deviations for social support dimensions in the HIV+ group and HIV/AIDS group.**

	HIV+ ( $n = 182$ ) <i>M (SD)</i>	HIV/AIDS ( $n = 128$ ) <i>M (SD)</i>	HIV+ vs. HIV/AIDS <i>t</i> test (308)	Cohen's <i>d</i>
<i>Social support</i>				
Perceived Available Support	23.43 (6.57)	22.35 (5.70)	-1.53	-.17
Need for Support	10.84 (2.28)	10.49 (2.34)	-1.32	-.15
Support Seeking	12.60 (3.18)	12.74 (3.18)	.33	.03
Actually Received Support	41.92 (9.07)	42.57 (9.15)	.62	.07

**Table 2. Pearson-r correlation coefficients for the BSSS, PTSDF, and FCB-TI scales (N=310).**

	Intrusion/ Arousal	Avoidance/ Numbing	Global Score	Briskness	Perseveration	Sensory sensitivity	Emotional reactivity	Endurance	Activity
<i>BSSS</i>									
Perceived Available Support	.20**	.14**	.17**	.19** (a)	-.15**	-.19**	-.18**	.17**	.10
Need for Support	.05	.05	.02	-.03(a)	-.03	-.10	-.03	-.03	.01
Support Seeking	.27**	.22**	.25**	-.04(a)	.06	-.06	.02	.05	.04
Actually Received Support	.16**	.13*	.15**	.06(a)	.06	-.09	-.10	.07	.02

Note: (a) Spearman-rho correlation coefficient \*  $p < .05$ ; \*\*  $p < .01$ .

**Table 3. Hierarchical regression analysis of demographic variables (age), selected temperament traits and particular social support aspects as predictors of HIV-related PTSD symptoms (N=310).**

Model	F	F $\Delta$	R	R <sup>2</sup>	Predictor	Semipartial correlation
Age	5,68(a)*	-	.13	.02	Age	.14*
+Sensory sensitivity	24.30(b)***	42.16***	.37	.14	Age Sensory sensitivity	.12* -.34***
+ Social support seeking	24.69(c)***	22.13***	.44	.20	Age Sensory sensitivity Social support seeking	.15** -.33*** .24***

Note: (a)  $df = 1/308$ , (b)  $df = 2/307$ ; (c)  $df = 3/306$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

**Table 4. Hierarchical regression analysis of demographic variables (age) and particular temperament traits as moderators of the relationship between selected social support aspects and level of PTSD symptoms among all tested HIV+ individuals (N = 310).**

Model	F	F $\Delta$	R	R <sup>2</sup>	Predictor	Semipartial correlation
Age	5,68(a)*	-	.13	.02	Age	.14*
+ Sensory sensitivity Social support seeking	24.69(b)***	33.59***	.44	.19	Age Sensory sensitivity Social support seeking	.15** -.33*** .24***
+ Sensory sensitivity x Social support seeking	19.46(c)***	3.22***	.45	.20	Age Sensory sensitivity Social support seeking Sensory sensitivity x Social support seeking	.14** -.34*** .23*** .09#

Note: (a)  $df = 1/308$ , (b)  $df = 3/306$ ; (c)  $df = 4/305$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

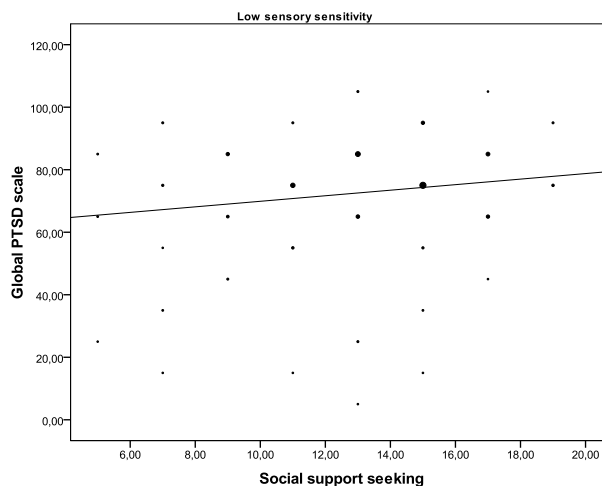
The analysis of the relationship between social support seeking and the general level of PTSD intensity, after controlling for age, within groups according to their level of sensory sensitivity, revealed a positive relationship both in a group with high (semipartial correlation = .28;  $p < .001$ ) and low sensory sensitivity (semipartial correlation = .18;  $p < .001$ ). In the model looking at the group with low sensory sensitivity fitness of data was close to statistical significance,  $F(2,156) = 2.61$ ;  $p < .10$ . In the model dealing with the group with high sensory sensitivity, good fitness of data was achieved,  $F(2,148) = 11.36$ ;  $p < .001$ . In both models, seeking of social support was a statistically significant and a positive predictor of the level of PTSD symptoms, however in the group of people with low sensory sensitivity, seeking of social support explained 3.2% of variance of the level of PTSD symptoms, and 13.3% of variance in the group with high sensory sensitivity. It means that among people with low sensory sensitivity, the relationship between the level of social support seeking and the intensity of PTSD symptoms is weaker than among people with high sensory sensitivity. Above mentioned results are presented on the Graph 1 and Graph 2.

**Discussion**

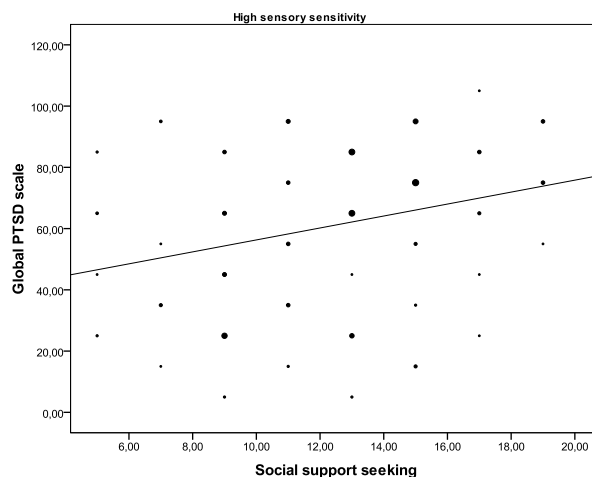
The results of our study suggest that some aspects of social support and some temperament traits may have a moderating effect on the origin and persistence of PTSD symptoms in HIV+ individuals.

We found no differences between HIV+ and HIV/AIDS individuals with respect to perceived available support, which is consistent with the literature (see: Table 1) (Ashton et al., 2005; Hansen, Vaughn, Cavanaugh, Connell, & Sikkema, 2009) and shows that social attitudes towards HIV+ individuals remain stable whatever the phase of the disease.

The results of the correlation analysis (see: Table 2) show that PTSD symptoms correlate weakly with social support. Three of the four aspects of support (support seeking, perceived available support and actually received support) correlate positively with the level of PTSD symptoms in this group. The greater the intensity of PTSD symptoms, the greater the level of support seeking, and the higher the ratings of available and received support. This may suggest that intensification of the trauma accompanying



**Graph 1. Scatter plot – the level of PTSD symptoms according to the intensity of social support seeking in the group of HIV+ individuals with low sensory sensitivity.**



**Graph 2. Scatter plot – the level of PTSD symptoms according to the intensity of social support seeking in the group of HIV+ individuals with high sensory sensitivity.**

HIV intensifies the need for support and availability of support may be rated more highly in conditions of social isolation (Abramowicz, Koenig & Chandwani, 2009; Lee, Detels, Rotheram-Borus, Duan, & Lord, 2007).

As far as temperament traits are concerned, they correlated only with one aspect of social support, perceived available support (see: Table 2). It looks as if the temperament of people experiencing difficulty orients them toward information seeking and motivates them to find out where and from whom they can get help and how available support networks are. This function of temperament seems to play an important part in adaptation to threat. More perseverating, sensory sensitive and emotionally reactive individuals rated the availability of support lower than individuals exhibiting opposite traits. On the other hand, individuals high on temperamental briskness and endurance rated the availability of support more highly, probably because they are more mobile and more likely to keep on looking for a solution to their problem (Strelau, 2008).

Positive correlations between age and the level of PTSD symptoms in the whole group of HIV+ individuals was observed (see: Table 3). It seems that the level of PTSD symptoms caused by HIV infection increases with age, which is consistent with some other studies (see: Hansen et al., 2009).

In addition to this, hierarchical regression analysis (see: Table 3) showed that sensory sensitivity accounts for 14% of the variance of global PTSD symptoms in HIV+ patients and sensory sensitivity and support seeking together account for 20% of the variance of the explained variable among the whole group of HIV+, when controlling for gender and age.

We were quite surprised to find that sensory sensitivity acts as a buffer in PTSD symptoms dynamics in HIV-infected individuals. This finding was also a major interpretative challenge because this trait did not correlate with the analyzed PTSD symptoms analyzed in victims of natural catastrophes (Strelau, 2008). When trying to explain this finding it is worth noting that sensory sensitivity compensates excessive or insufficient stimulation. When there are too many or too few stimuli in the environment, sensory sensitivity may change so as to restore effective regulation of stimulation. In HIV+ individuals, the PTSD symptoms caused by the experience of a life-threatening disease probably lead to chronic, internal arousal (Safren, Gershuny, & Hendriksen, 2003; Theuninck, Lake, & Gibson, 2010). On the other hand, the discrimination and social isolation which so many HIV+ individuals experience may deprive them of a considerable amount of environmental stimulation (Lee, Detels, Rotheram-Borus, Duan, & Lord, 2007; Li et al., 2008). Intensification of sensory sensitivity may then help to compensate these processes, in which case, we may view this trait as an element of the information processing system and therefore as a property lying at the interface of not only temperament but also ability, a property which restores effective stimulation regulation.

Another significant predictor of intensity of PTSD symptoms was social support seeking. When trying to interpret the significance of this predictor it is worth noting

that the proliferation of HIV/AIDS evoked many negative social and psychological phenomena which disclosed lack of tolerance, poor education and strong reliance on stereotypes (Adewuya et al., 2009; Chin & Kroesen, 1999). Despite their stigmatisation and social isolation, HIV-infected people need to feel close to people. Despite their fear of disclosure, progressive trauma may motivate them to seek help and psychological support from other people (see earlier reports by Heckman et al., 2004; Davey, Foster, Milton & Duncan, 2009; Schachman et al., 2007).

However, our study demonstrated that sensory sensitivity is a moderator of relationship between social support seeking and the global PTSD level (see: Table 4). Among HIV+ individuals high on sensory sensitivity there is stronger, positive relation between social support seeking and the level of PTSD symptoms in comparison to HIV + people with low sensory sensitivity. When trying to explain this finding it is worth again mentioning the fact that sensory sensitivity compensates excessive or insufficient stimulation. In other words, intensification of this temperament trait may help HIV+ people to compensate negative social attitudes toward them. Perhaps also in this context sensory sensitivity acts as a buffer in PTSD symptoms dynamics in HIV-infected individuals.

To sum up it is worth noting that our study also has its limitations. Above all we did not investigate the relation between availability of support networks and intensity of PTSD symptoms associated with HIV infection. It is also not quite clear whether our chosen method of temperament assessment or the dimensions of social support change are modified by the experience of HIV/AIDS and if so, how. Despite these limitations, we think that further psychological research with HIV-infected individuals is justified. It is important to know how support for HIV-infected individuals relates to their personality traits because this may help to improve patients' quality of life.

## Conclusions

Support seeking increases with the increase in intensity of PTSD symptoms. Sensory sensitivity associated with perceived support may act as a buffer protecting HIV+ individuals from excessive development of PTSD symptoms.

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