**Can subjective perceptions of trauma differentiate between ICD-11 PTSD and Complex PTSD? A Cross – cultural Comparison of Three African Countries**

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**Keywords:** ICD-11; Complex PTSD; Africa; Subjective; Perception; Trauma

**Can subjective perceptions of trauma differentiate between ICD-11 PTSD and Complex PTSD? A Cross – cultural Comparison of Three African Countries**

**Abstract**

**Background**: The primary aim of the current study was to establish the cut-offs scores for the Subjective Traumatic Outlook (STO), a relatively new tool that examines the introspective world view of those exposed to traumatic events. This tool was developed as a complementary scale to be used in conjunction with the observed-phenomenological measures of PTSD. The present study examines the predictive power of STO for distinguishing between PTSD and Complex PTSD (CPTSD) in African countries.

**Methods**: A national representative (based on age and gender) sample of 2554 participants was drawn form three African countries, Nigeria, Kenya and Ghana, who completed the International Trauma Questionnaire (ITQ) and the STO. We conducted a set of analyses examining that alignment of ITQ probable PTSD and CPTSD and different STO cut-off scores.

**Results**: Results suggest that the STO single factor structure was stable across countries, had a strong association with PTSD and CPTSD levels, and had predictive utility in differentiating between PTSD and CPTSD. Moreover, we found that there are different cut-offs for the STO in the different countries.

**Conclusion**: There is a strong but distinctive association between the introspective and the observed-phenomenological approaches of PTSD and CPTSD. Our findings call for more integrative approaches for the assessment of PTSD and CPTSD and suggest that there are cultural differences in STO.

Keywords: Subjective traumatic outlook (STO), PTSD, Complex PTSD (CPTSD), ICD-11

Clinical Impact Statement

This study provided evidence on for the STO cut-offs for predicting PTSD and CPTSD. This is a short and easy to handle self-report tool that can help clinicians broaden their understanding of the severity and characteristics of one’s inner traumatic experience. By combining information collected with the STO and conventional PTSD/CPTSD assessments, clinicians may have better and deeper understanding of the impact of traumatic events.

**Introduction**

Since the appearance of the classification of posttraumatic stress disorder (PTSD) in diagnostic systems, two parallel approaches emerged to describe this condition. The phenomenological approach refers to observed external manifestation of physical, behavioral and cognitive symptoms that appear in the aftermath of the exposure (Regier, Kuhl, & Kupfer, 2013). This approach defines PTSD as the combination of several observed symptoms, which are described in the Diagnostic and Statistical Manual of Mental Disorders (DSM; APA, 2013) or the International Classification of Diseases (ICD; Maercker et al., 2013).

However, alongside the phenomenological approach there is an inner-introspective, psychological approach for understanding the development and dynamic of the trauma. This approach refers to the way in which the trauma is subjectively perceived and represented by the person in his or her inner world (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999; Palgi et al., 2018). This approach was mainly used among clinicians, and serves to describe inner processes that explain the development of the disorder (Herman, 1992).

The observed-phenomenological approach and the inner-introspective approach served along the years as two distinct but complementary perspectives to describe post-traumatic reactions. While the former describes the external factual manifestation of the disorder, that is focused on “informative” (e.g., sleeping impairment) or “evaluative” (e.g., negative emotions) symptoms reported by the person, the later focus on subjective “perspective” and describes the inner introspective view and general perspective individuals develop about their traumatic condition.

A major change in field of psychological trauma occurred with the release of the ICD-11 guidelines. Along with the definition of PTSD that consists of six symptoms organized in three clusters: re-experiencing of the traumatic event(s), avoidance of traumatic reminders and sense of threat, a new disorder of complex PTSD (CPTSD; Cloitre et al., 2013) was introduced. CPTSD predominantly follows repeated or prolonged traumatic events such as genocide, childhood abuse, torture etc. (Karatzias et al., 2016) or more generally interpersonal trauma (Cloitre et al., 2013). Furthermore, the seperation of PTSD and CPTSD into two separate disorders gained support through the years and it is now well documented in the literature (Karatzias et al., 2017; Ben-Ezra et al., 2018). CPTSD is comprised of both PTSD symptoms and the additional presence of impairment in three self-organization clusters: negative self-concept, affective dysregulation and disturbed relationships (DSO; Ben-Ezra et al., 2018; Cloitre et al., 2013; Hyland et al., 2016).

Recently, it was shown that the Subjective Traumatic Outlook (STO) scale, a short questionnaire that refers to the inner-introspective shifts that occur to one’s self-perspective following exposure to traumatic experiences, has differential cut-offs for predicting elevated risk for PTSD and CPTSD (Mahat-Shamir et al., 2019). This questionnaire does not refer to psychiatric symptoms and is not intended to define PTSD or CPTSD. It postulates that individuals who suffer from posttraumatic symptoms hold an explicit awareness of themselves as traumatized. By looking at their lives in a time-related perspective, they are able to integrate a good subjective evaluation of their condition. According to this conceptualization, those who suffer from PTSD or CPTSD find it difficult to integrate three discrepancies; between life before the trauma versus current traumatized life; between the external functioning self and their inner traumatic impaired self; between one’s current external social life and the contradictory inner chaotic traumatic feelings and thoughts that cannot be connected to the world in which they now live (Palgi et al., 2018). Levels of STO suggest that one’s inability to integrate these experiences aggravate the traumatic response and may be a good predictor for the severity of the traumatization (Palgi, Shrira & Ben-Ezra, 2017). Higher levels of STO suggest stronger associations between their base level of PTSD symptoms and their level of PTSD symptoms two years later (Palgi et al., 2018). PTSD and STO levels were also seem to increase concurrently (Palgi et al., 2018).

The present study has the following aims. First, we aim to replicate previous results (Mahat-Shamir et al., 2019) that showed different cut-offs for PTSD (score of 10 or higher on the STO) and for CPTSD (score of 15 or higher on the STO). Defining these cut-offs of the STO will allow clinicians to have a more comprehensive overview of their patients external and internal experiences following traumatic life events. These cut-offs are intended to provide an additional perspective for understanding the mechanisms that underline the development of these disorders and their severity. Second, the WHO publication of the 11th version of the ICD-11 in 2018, markedly revised the criteria for PTSD from the ICD-10 and included CPTSD as a new condition (Maercker et al., 2013). It is required, therefore, that emerging research will explore the association between CPTSD and other relevant constructs in different countries. Finally, studies focused on cultural differences regarding the prevalence of stress-related disorders on the African continent are scarce. Previous studies conducted in African countries showed systematically that years of wars, genocide, poverty and natural disasters have been a source of trauma on a massive scale (Njenga, Kigamwa, & Okonji, 2003; Neuner et al., 2004). These studies show that African citizens suffer from a very high level of posttraumatic symptoms (Njenga, Nguithi, & Kang'ethe 2006), and that these symptoms are also transmitted to the next generation (Shrira, Molove & Mudahogora, 2019). Yet in spite of this devastating public health problem, the study of posttraumatic stress disorder and complex posttraumatic stress disorder in these countries is rare (Ben-Ezra et al., 2020).

We hypothesized that (1) the STO scores will be unidimensional across different countries, (2) different STO levels will be found for those who have clinical levels of PTSD/CPTSD comparing to those who do not reach the clinical level (3) there will be a difference between STO cut-offs for PTSD and for CPTSD, and (4) cultural differences in the STO cut-offs may be apparent in the different countries.

**Methods**

*Participants and Procedure*

A total of 2,524 participants drawn from Nigeria (*n* = 1,018), Kenya (*n* = 1,006), and Ghana (*n* = 500) were included in this study. Each nationally representative sample (based on age and gender) was obtained via an internet panel of 26,500 Nigerians, 20,800 Kenyans, and 12,500 Ghanaians. The response rates for each sample were 23.0% (Nigeria), 34.0% (Kenya), and 33.0% (Ghana). In order to maintain a close approximation of representativeness in terms of census data on age and sex in each country, each sample was drawn from the panel using stratified and random probability sampling methods. Following ethical approval from the researchers’ university, potential participants were invited to participate in the study via email. Each participant signed an electronic informed consent document before accessing the questionnaire. Eligibility for participation included citizenship of one of the aforementioned countries, being aged 18 years or older at the time of the survey and possessing English proficiency sufficient to complete the surveys. Demographic details for each sample are presented in Table 1. Prevalence of traumatic events for each country is presented in Table 1s as part of the online supporting material.

[Insert Table 1 about here]

*Measurements*

Subjective perceptions of psychological trauma were measured by the Subjective Traumatic Outlook scale (STO; Palgi, Shrira & Ben-Ezra, 2017). This 5-item scale measures the subjective experience of psychological trauma on a five-point Likert scale ranging from `1` not at all to `5` very much. The sum of scores is an indication of the severity of the subjective impact of psychological trauma. Possible scores range from 5-25and scores from the STO have good psychometric properties (Palgi, Shrira & Ben-Ezra, 2017). Cronbach’s alpha for the current study was .89 in Nigeria, .89 in Kenya and .91 in Ghana. For more details, see Appendix 1.

*PTSD and CPTSD* symptoms were measured using the International Trauma Questionnaire (ITQ; Cloitre et al., 2018). The ITQ includes six PTSD items and six `Disturbances in Self-Organization’ (DSO) items. The PTSD symptom clusters of re-experiencing in the here and now, avoidance, and sense of threat are measured using two items each. There are three items measuring functional impairment associated with these symptoms. The DSO symptom clusters of aﬀective dysregulation, negative self-concept, and disturbances in relationship are measured by two items each. Additionally, three items measure functional impairment associated with these symptoms. The internal consistency estimates (Nigerian sample, α = .93; Kenyan sample, α = .93; Ghanaian sample, α = .92) of the ITQ in this study were excellent.

*PTSD* items are answered in terms of how much one has been bothered by each symptom in the past month, and the DSO items are answered in terms of how one typically responds. All items were answered using a ﬁve-point Likert scale ranging from ‘Not at all’ (0) to ‘Extremely’ (4). Following standard practice in trauma research (Elklit & Shevlin, 2007; Karatzias et al., 2017), scores ≥2 (‘Moderately’) were used to indicate the presence of a symptom. Diagnosis of PTSD requires traumatic exposure, the endorsement of one of two symptoms from each PTSD cluster, and endorsement of functional impairment associated with these symptoms. Diagnosis of CPTSD requires trauma exposure, the endorsement of one of two symptoms from each of the six PTSD and DSO clusters, plus endorsement of functional impairment associated with both sets of symptoms. The ICD-11 taxonomic structure dictates that a person may only receive a diagnosis of PTSD or CPTSD, but not both.

*Data Analysis*

Our initial aim was to replicate previous results confirming the one factor solution for the STO using exploratory factor analysis (Palgi, Shrira & Ben-Ezra, 2017). We have conducted exploratory factor analysis for each country and the whole sample.

In order to establish cut-off points that are clinically meaningful and examine if STO levels can differentiate between PTSD and Complex PTSD, we conducted a one-way ANOVA for STO scores based on the following groups: (1 = no endorsement; 2 = endorsement of ICD-11 PTSD; 3 = endorsement of ICD-11 Complex PTSD). These analyses were accompanied by post-hoc Tukey’s tests (Tukey, 1949). Following that, ROC analysis using standard practice (Greiner et al., 2000) was conducted in which the state variable was the binary option for each endorsement (0 = not meeting criteria vs. 1 = meeting ICD-11 PTSD criteria) and (0 = not meeting criteria vs. 1 = meeting ICD-11 CPTSD criteria). The test variable was the sum of scores of the STO scale. Next, a comparison of Area Under the Curve (AUC) was conducted using z transformation in order to compare the differences between AUC (Hanley & McNeil, 1982) regarding PTSD vs. Complex PTSD.

Next, Youden's index was obtained to identify optimum cut-off scores for the different samples. Finally, the sensitivity, specificity, positive predictive value, negative predictive value and accuracy of the STO scores was assessed for each country. These analyses were conducted separately for each country and for the whole sample.

**Results**

The results of the factor analysis revealed one factor solution for the STO in each of the African countries. The one factor solution had an eigenvalue greater than one and this factor accounted for 70.9% variance in Kenya, 70.1% variance in Nigeria and 73.4% in Ghana. A cross-country comparison of the variance showed no significant differences. The whole sample yielded a similar result of one factor accounting for 71.6% of the variance.

The rate of probable PTSD in Nigeria was 17.4%, 20.3% in Kenya and 17.6% in Ghana. Probable CPTSD rates were 19.6% in Nigeria, 13.7% in Kenya and 13.0% in Ghana. These rates have been reported elsewhere (Ben-Ezra et al., 2020).

The ANOVA results showed a significant difference between the countries. The pattern that was consistent across all the African countries showed the STO score was the lowest among the group that did not meet and ICD-11 criteria (mean scores ranged from 8.31 to 9.64). These scores were lower in comparison to the group that endorsed ICD-11 PTSD (mean scores ranged from 10.78 to 12.56) and even more when compared to the group endorsing ICD-11 Complex PTSD criteria (mean scores ranged from 16.01 to 16.82). These differences were statistically significant with *F* ranges from 105.48-198.04 all significant at *p* < 0.001. Post-hoc comparisons using Tukey’s test revealed the same pattern across countries, with groups being significantly different from one another at *p*<0.001. The same results were found for the whole sample (See Table 2 for more information).

[Insert Table 2 around here]

ROC analyses revealed a similar pattern across the African countries when comparing the AUC for STO scores against ICD-11 PTSD criteria vs. AUC for STO scores against ICD-11 Complex PTSD criteria. The AUC for PTSD ranged from 0.686-0.721 while the AUC for Complex PTSD ranged from 0.876-0.889. Transforming the AUC delta into z-scores revealed scores ranging from 3.93 to 6.39. All the z scores were significant at *p* < 0.001. Similar results were found for the whole sample. See Table 3 for more information and online supporting figures 1-8.

[Insert Table 3 around here]

Finally, based on Youden index along with measures of sensitivity, specify, positive predictive value, negative predictive value and accuracy, the cut-off scores for each country were slightly different but presented a consistent pattern that delineate PTSD from Complex PTSD.

The suggested cutoff scores for Nigeria were STO ≥ 8 as an indicator for elevated risk for endorsing PTSD and STO ≥ 13 as an indicator for elevated risk for also endorsing Complex PTSD. Similar results were found in Kenya (STO ≥ 10 and STO ≥ 13 respectively) and Ghana (STO ≥ 8 and STO ≥ 14). See Table 4 for more information.

[Insert Table 4 around here]

For the whole sample, suggested STO scores of ≥ 9 were indicative of elevated risk for PTSD and STO ≥ 13 indicative of elevated risk for Complex PTSD. See Table 5 for more information.

[Insert Table 5 around here]

Finally, we have explored the difference between the STO scores while controlling for PTSD symptoms. Following Grossman et al., (2019), we conducted an ANCOVA using CPTSD and PTSD as grouping variable, PTSD symptoms were controlled and STO scores were the dependent variable. The probable PTSD group had a STO score of 11.62 (*SD* = 4.62) in comparison to the probable CPTSD group that had a STO score of 16.47 (*SD* = 4.94), while controlling for PTSD symptoms.

The contrast estimate (difference between the CPTSD group to the PTSD group in STO scores while controlling for PTSD symptoms) was 4.221 at *p* <.001*.* The F score was 173.642 at *p* <.001 and partial *η2*value of .167.

**Discussion**

Our first aim was to replicate, in three African countries, the unidimensional structure for STO that has been reported in previous research. The second aim was to attempt to replicate previous findings that showed that STO could differentiate PTSD/CPTSD. Third, we aimed to explore whether STO presents with different cut-offs for PTSD and CPTSD. Fourth, it was aimed to explore differences in cut-offs across all different African countries.

Results have confirmed previous research (Palgi, Shrira & Ben-Ezra, 2017) that suggests a one-factor solution of STO. Our findings have also confirmed previous research suggesting that STO levels differ between those with PTSD/ CPTSD vs. those without (Palgi, Shrira & Ben-Ezra, 2017; Palgi et al., 2018; Mahat-Shamir et al., 2019). Furthermore, STO cutoff scores were found to differentiate CPTSD from PTSD suggesting that STO can be used as a complementary tool that can provide additional information regarding one’s inner-introspective levels of PTSD and CPTSD. These findings also replicate previous findings that the STO is a good predictor for PTSD and CPTSD (Mahat-Shamir et al., 2019).

Overall our findings support previous research suggested that inner-subjective perceptions people made about their condition are good predictors of external symptoms they reported about themselves (Idler & Benyamini, 1997), their subjective cognitive condition (Mitchell, Beaumont, Ferguson, Yadegarfar, & Stubbs, 2014). Findings also suggest that individuals can make subjective evaluations intuitively and describe accurately the level of their inner-psychological traumatic world and their traumatic impairment (Mahat Shamir et al., 2019). Moreover, our results show that that the STO may differentiate in a very reliable way between those who suffer from PTSD to those who suffer from CPTSD. The impact of psychological trauma requires integrative studies that incorporate observed-phenomenological and inner-introspective approaches together. It is suggested that the interplay between the observed-phenomenological and the subjective clinical approaches is essential to provide a deeper understanding of the traumatic experiences (Milchman, 2016). In that way, the findings of the current study serve as the first step in that direction.

The present study is one of the the first population-based studies conducted in African countries that examined the ICD-11 trauma classifications and it was interesting to confirm the strong association between STO and PTSD /CPTSD which was observed in non-western countries (Mahat Shamir et al., 2019). Furthermore, the African countries that were selected vary in levels and types of trauma exposure distribution. For example, traumatic outcome of high level of individuals who suffer from HIV (Adewuya et al., 2009), ethnoreligious conflicts (Obilom 2008) and war related traumas are observed in Nigeria (Abel et al., 2018) whereas violence against women is predominantly observed in Ghana (Issahaku 2015). Our results show that the cut-off levels are different among the different African countries and from previous findings from Israel. For example, the STO cut-off for CPTSD in Ghana (STO≥14) was higher than in Nigeria and Kenya (STO≥13), and they all were lower than the cut-off found in Israel (STO≥15) in a previous study (Mahat-Shamir et al., 2019). The STO cut-off for PTSD in Kenya (STO≥10) was similar to the cut-off found previously in Israel (Mahat-Shamir et al., 2019) and higher than Nigeria and Ghana (STO≥8). It is not possible to elaborate further on these findings but future research is required to explore further these differences. One possible explanation might be that subjective perceptions of traumatic distress differ in different cultural contexts.

Our findings should be viewed in light of the study's limitations. First our study was cross-sectional using an internet panel and therefore it had generally low response rate, as well as it involved predominantly individuals with generally high education. Second, we did not explore whether certain types of traumas affect STO. There is evidence to suggest that certain traumatic life events are predominantly associated with CPTSD (Hoffman et al., 2018; Karatzias et al., 2017) and it might well be the case that the same goes for STO. Finally, we did not examine the duration of trauma exposure whether it was a repeated or prolonged traumatization or a single event.

To conclude, this study is the first to explore STO cutoffs that predict PTSD and CPTSD in three African countries. Our results support previous research in the area and suggest that the STO is an excellent tool for screening for the severity of the inner-introspective level of the traumatic impairment. Moreover, the results encourage further research on the integration of these two approaches in an attempt to understand better the impact of traumatic life events.

**References**

Abel, J., Anongo, F. S., & Dami, B. E. Ogbole, A. J., Abel, A. A., Dagona, Z. K. (2018). Combat exposure and peritraumatic factors predicting PTSD among military personnel fighting insurgency in Nigeria. *Journal of Anxiety and Depression*, *1*, 108.‏

Adewuya, A. O., Afolabi, M. O., Ola, B. A., Ogundele, O. A., Ajibare, A. O., Oladipo, B. F., & Fakande, I. (2009). Post-traumatic stress disorder (PTSD) after stigma related events in HIV infected individuals in Nigeria. *Social Psychiatry and Psychiatric Epidemiology*, *44*(9), 761-766. ‏ doi:10.1007/s00127-009-0493-7

American Psychiatric Association, (2013). *Diagnostic and Statistical Manual of Mental Disorders 5th Ed*. American Psychiatric Association, Arlington, VA.

Ben‐Ezra, M., Karatzias, T., Hyland, P., Brewin, C. R., Cloitre, M., Bisson, J. I., ... & Shevlin, M. (2018). Posttraumatic stress disorder (PTSD) and complex PTSD (CPTSD) as per ICD‐11 proposals: A population study in Israel. *Depression and anxiety*, *35*, 264-274.

<https://doi.org/10.1002/da.22723>

Ben-Ezra, M., Hyland, P., Karatzias, T., Maercker, A., Hamama-Raz, Y., Lavenda, O., ... & Shevlin, M. (2020). A cross-country psychiatric screening of ICD-11 disorders specifically associated with stress in Kenya, Nigeria and Ghana. *European Journal of Psychotraumatology, 11*, 1720972.

Cloitre, M., Garvert, D. W., Brewin, C.R., Bryant, R.A., Maercker, A. (2013). Evidence for proposed ICD-11 PTSD and complex PTSD: A latent profile analysis. *European Journal Psychotraumatolgy, 4*, 20706.

Cloitre, M., Shevlin, M., Brewin, C. R., Bisson, J. I., Roberts, N. P., Maercker, A., ... & Hyland, P. (2018). The International Trauma Questionnaire: development of a self‐report measure of ICD‐11 PTSD and complex PTSD. *Acta Psychiatrica Scandinavica*, *138*, 536-546.‏ <https://doi.org/10.1111/acps.12956>

Elklit, A., & Shevlin, M. (2007). The structure of PTSD symptoms: A test of alternative models using confirmatory factor analysis. *British Journal of Clinical Psychology*, *46*, 299-313.

<https://doi.org/10.1348/014466506X171540>

Foa, E. B., Ehlers, A., Clark, D. M., Tolin, D. F., & Orsillo, S. M. (1999). The posttraumatic cognitions inventory (PTCI): Development and validation. *Psychological Assessment*, *11*(3), 303-314. ‏ doi:10.1037/1040-3590.11.3.303

Greiner, M., Pfeiffer, D., & Smith, R. D. (2000). Principles and practical application of the receiver-operating characteristic analysis for diagnostic tests. *Preventive Veterinary Medicine*, *45*, 23-41.‏ <https://doi.org/10.1016/S0167-5877(00)00115-X>

Grossman, E. S., Hoffman, Y. S., Shrira, A., Kedar, M., Ben-Ezra, M., Dinnayi, M., & Zivotofsky, A. Z. (2019). Preliminary evidence linking complex-PTSD to insomnia in a sample of Yazidi genocide survivors. *Psychiatry Research, 271*, 161-166. [doi:10.1016/j.psychres.2018.11.044](https://doi.org/10.1016/j.psychres.2018.11.044)

Hanley, J. A., & McNeil, B. J. (1982). The meaning and use of the area under a receiver operating characteristic (ROC) curve. *Radiology*, *143*, 29-36.‏ <https://doi.org/10.1148/radiology.143.1.7063747>

Herman, J. L. (1992). Complex PTSD: A syndrome in survivors of prolonged and repeated trauma. *Journal of Traumatic Stress*, *5*, 377-391. ‏ <https://doi.org/10.1002/jts.2490050305>

Hoffman, Y., Shrira, A., Kedar, M., Ben-Ezra, M., Koren, L., Grossman, E., … & Zivotofsky, A.Z. (2018). Complex PTSD and its correlates amongst female Yazidi victims of sexual Jihad residing in Post-ISIS Camps. *World Psychiatry*. 17, 112-113. doi: [10.1002/wps.20475](https://dx.doi.org/10.1002%2Fwps.20475)

Hyland, P., Shevlin, M., Elklit, A., Murphy, J., Vallières, F., Garvert, D. W., & Cloitre, M. (2017). An assessment of the construct validity of the ICD-11 proposal for complex posttraumatic stress disorder. *Psychological Trauma: Theory, Research, Practice, and Policy*, *9*, 1-9.‏ <http://dx.doi.org/10.1037/tra0000114>

Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: a review of twenty-seven community studies. *Journal of health and social behavior*, 21-37. ‏ <https://www.jstor.org/stable/2955359>

Issahaku, P. A. (2015). Health implications of partner violence against women in Ghana. *Violence and Victims*, *30*, 250-264. ‏ doi:10.1891/0886-6708.VV-D-13-00075

Karatzias, T., Shevlin, M., Fyvie, C., Hyland, P., Efthymiadou, E., Wilson, D., ... & Cloitre, M. (2016). An initial psychometric assessment of an ICD-11 based measure of PTSD and complex PTSD (ICD-TQ): Evidence of construct validity. *Journal of Anxiety Disorders*, *44*, 73-79.‏ <https://doi.org/10.1016/j.janxdis.2016.10.009>

Karatzias, T., Shevlin, M., Fyvie, C., Hyland, P., Efthymiadou, E., Wilson, D., ... & Cloitre, M. (2017). Evidence of distinct profiles of posttraumatic stress disorder (PTSD) and complex posttraumatic stress disorder (CPTSD) based on the new ICD-11 trauma questionnaire (ICD-TQ). *Journal of Affective Disorders*, *207*, 181-187.‏ <https://doi.org/10.1016/j.jad.2016.09.032>

Kotter-Grühn, D., Grühn, D., & Smith, J. (2010). Predicting one’s own death: the relationship between subjective and objective nearness to death in very old age. *European Journal of Ageing*, *7*, 293-300.‏ <https://doi.org/10.1007/s10433-010-0165-1>

Maercker, A., Brewin, C. R., Bryant, R. A., Cloitre, M., van Ommeren, M., Jones, L. M., ... & Somasundaram, D. J. (2013). Diagnosis and classification of disorders specifically associated with stress: proposals for ICD‐11. *World Psychiatry*, *12*, 198-206.

<https://doi.org/10.1002/wps.20057>

Mahat-Shamir, M., Lavenda, O., Palgi, Y., Hamama-Raz, Y., Greenblatt-Kimron, L., Pitcho-Prelorentzos, S., ... & Ben-Ezra, M. (2019). Subjective traumatic outlook as a screening tool for psychological trauma: Cut-off values and diagnostic criteria. *Psychiatry Research*, *273*, 121-126. <https://doi.org/10.1016/j.psychres.2019.01.014>

Milchman, M. S. (2016). Forensic implications of changes in DSM-5 criteria for responses to trauma and stress. *International Journal of Law and Psychiatry*, *49*, 163-182.‏ <https://doi.org/10.1016/j.ijlp.2016.10.004>

Neuner, F., Schauer, M., Karunakara, U., Klaschik, C., Robert, C., & Elbert, T. (2004). Psychological trauma and evidence for enhanced vulnerability for posttraumatic stress disorder through previous trauma among West Nile refugees. *BMC Psychiatry*, *4*, 34. <https://doi.org/10.1186/1471-244X-4-34>

Njenga, F. G., Kigamwa, P., & Okonji, M. (2003). Africa: the traumatised continent, a continent with hope. *International Psychiatry*, *1*, 4-7. <https://doi.org/10.1192/S1749367600007608>

Njenga, F. G., Nguithi, A. N., & Kang'ethe, R. N. (2006). War and mental disorders in Africa. *World Psychiatry*, *5*(1), 38.

Obilom, R. E., & Thacher, T. D. (2008). Posttraumatic stress disorder following ethnoreligious conflict in Jos, Nigeria. *Journal of Interpersonal Violence*, *23*, 1108-1119.‏ [https://doi.org/10.1177/0886260507313975](https://doi.org/10.1177%2F0886260507313975)

Palgi, Y., Avidor, S., Shrira, A., Bodner, E., Ben-Ezra, M., Zaslavsky, O., & Hoffman, Y. (2018). Perception Counts: The Relationships of Inner Perceptions of Trauma and PTSD Symptoms Across Time. Psychiatry: Interpersonal and Biological Processes, 81, 361-375.‏ <https://doi.org/10.1080/00332747.2018.1485370>

Palgi, Y., Shrira, A., & Ben-Ezra, M. (2017). The theoretical and psychometric properties of the Subjective Traumatic Outlook (STO) questionnaire. *Psychiatry Research*, *253*, 165-173.‏ <https://doi.org/10.1016/j.psychres.2017.03.050>

Regier, D. A., Kuhl, E. A., & Kupfer, D. J. (2013). The DSM‐5: Classification and criteria changes. *World Psychiatry*, *12*, 92-98.‏ <https://doi.org/10.1002/wps.20050>

Shrira, A., Mollov, B., & Mudahogora, C. (2019). Complex PTSD and intergenerational transmission of distress and resilience among Tutsi genocide survivors and their offspring: A preliminary report. *Psychiatry Research, 271, 121–123.*  doi:10.1016/j.psychres.2018.11.040

Tukey, J. W. (1949). Comparing individual means in the analysis of variance. *Biometrics*, 99-114.‏ <https://www.jstor.org/stable/3001913>

Weathers, F. W., Blake, D. D., Schnurr, P. P., Kaloupek, D. G., Marx, B. P., & Keane, T. M. (2013). The life events checklist for DSM-5 (LEC-5). Instrument available from the National Center for PTSD. ‏

Table 1. Basic demographics of the study samples

|  |  |  |  |
| --- | --- | --- | --- |
|  | Nigeria  (n = 1018) | Kenya  (n = 1006) | Ghana  (n = 500) |
| Age, Mean (SD) | 30.15 (8.72) | 32.23 (9.36) | 28.96 (7.93) |
| Sex, women, n (%) | 501 (49.8) | 500 (49.1) | 250 (50.0) |
| Marital status, in committed relationship, n (%) | 553 (55.0) | 565 (55.5) | 228 (45.6) |
| Employment, n (%) |  |  |  |
| Not employed, not seeking work | 65 (6.5) | 78 (7.7) | 41 (8.2) |
| Not employed, seeking work | 318 (31.6) | 299 (29.4) | 157 (31.4) |
| Part-time employed | 198 (19.7) | 183 (18.0) | 84 (16.8) |
| Full-time employed | 369 (36.7) | 392 (38.5) | 176 (35.2) |
| Voluntary work | 56 (5.6) | 66 (6.5) | 42 (8.4) |
| Education, n (%) |  |  |  |
| Primary school/No formal education | 1 (0.1) | 1 (0.1) | 4 (0.8) |
| Secondary school | 83 (8.3) | 61 (6.0) | 54 (10.8) |
| College/University | 922 (91.7) | 956 (93.9) | 442 (88.4) |
| Area, n (%) |  |  |  |
| Urban | 611 (60.7) | 709 (69.6) | 297 (59.4) |
| Suburb | 235 (23.4) | 240 (23.6) | 140 (28.0) |
| Rural | 160 (15.9) | 69 (6.8) | 63 (12.6) |

Table 2. STO scores based on PTSD and CPTSD diagnostic algorithm using One-Way ANOVA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Not meeting criteria | Meeting ICD-11 PTSD | Meeting ICD-11 CPTSD | One-Way ANOVA | significance | Partial η2 | Post-hoc Tukey’s Test |
| Nigeria (n =1018) | N = 672 | N = 207 | N = 139 | F | p | 0.281 | 1≠2; 1≠3; 2≠3 |
| STO mean score (S.D) | 8.31 (3.92) | 10.78 (4.43) | 16.01 (5.21) | 198.04 | <0.001 |  | <0.001 |
| Kenya (n = 1006) | N = 634 | N = 175 | N= 197 | F | p | 0.265 | 1≠2; 1≠3; 2≠3 |
| STO mean score (S.D) | 9.64 (4.55) | 12.56 (4.73) | 16.69 (4.71) | 180.81 | <0.001 |  | <0.001 |
| Ghana (N = 500) | N= 347 | N = 88 | N = 65 | F | p | 0.298 | 1≠2; 1≠3; 2≠3 |
| STO mean score (S.D) | 8.49 (4.22) | 11.70 (4.54) | 16.82 (5.03) | 105.48 | <0.001 |  | <0.001 |
| African countries  (N = 2524) | N= 1653  8.85 (4.27) | N = 470  11.62 (4.62) | N = 401  16.47 (4.94) | F  488.12 | p  <0.001 | 0.279 | 1≠2; 1≠3; 2≠3  <0.001 |
| STO mean score (S.D) |  |  |  |  |  |  |  |

Table 3. AUC Comparison per country for STO total score vs. ICD-11 PTSD and Complex PTSD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Nigeria (n= 1018) | Kenya (n = 1006) | Ghana (n = 500) | Total (n = 2524) |
| AUC PTSD | 0.686 | 0.687 | 0.721 | 0.689 |
| AUC CPTSD | 0.876 | 0.854 | 0.889 | 0.871 |
| Delta AUV (CPTSD – PTSD) | 0.190 | 0.167 | 0.168 | 0.182 |
| Z score | 6.39 | 5.57 | 3.93 | 9.66 |
| P value | <0.001 | <0.001 | <0.001 | <0.001 |

Table 4. Proposed STO cutoffs based on different diagnostic systems and PTSD/CPTSD

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Nigeria (n = 1018) | | Kenya (N = 1006) | | Ghana (n = 500) | |
|  | ICD-11 PTSD criteria | ICD-11 CPTSD criteria | ICD-11 PTSD criteria | ICD-11 CPTSD criteria | ICD-11 PTSD criteria | ICD-11 CPTSD criteria |
| Statistics for STO |  |  |  |  |  |  |
| Sensitivity | 72.95%  (95% C.I. 66.35%-78.87%) | 79.14%  (95% C.I. 71.43%-85.56%) | 72.00%  (95% C.I. 64.73%-78.51%) | 79.19%  (95% C.I. 72.84%-84.63%) | 79.55%  (95% C.I. 69.61%-87.40%) | 75.38%  (95% C.I. 63.13%-85.23%) |
| Specificity | 56.99%  (95% C.I. 53.15%-60.77%) | 84.08%  (95% C.I. 81.09%-85.56%) | 59.46%  (95% C.I. 55.53%-63.31%) | 76.97%  (95% C.I. 73.49%-80.20%) | 55.33%  (95% C.I. 49.93%-60.64%) | 86.74%  (95% C.I. 82.72%-90.13%) |
| Positive Predictive Value | 34.32%  (95% C.I. 31.66%-37.08%) | 50.69%  (95% C.I. 45.86%-55.51%) | 32.90%  (95% C.I. 30.05%-35.88%) | 51.66%  (95% C.I. 47.68%-55.62%) | 31.11%  (95% C.I. 27.83%-34.59%) | 51.58%  (95% C.I. 44.04%-59.05%) |
| Negative predictive Value | 87.24%  (95% C.I. 84.42%-89.62%) | 95.12%  (95% C.I. 93.36%-96.43%) | 88.50%  (95% C.I. 85.75%-90.78%) | 92.25%  (95% C.I. 90.03%-94.01%) | 91.43%  (95% C.I. 87.48%-94.21%) | 94.95%  (95% C.I. 92.46%-96.65%) |
| Accuracy | 60.75%  (95% C.I. 57.43%-64.00%) | 83.23%  (95% C.I. 80.48%-85.74%) | 62.18%  (95% C.I. 58.73%-65.53%) | 77.50%  (95% C.I. 74.50%-80.29%) | 60.23%  (95% C.I. 55.46%-64.86%) | 84.95%  (95% C.I. 81.13%-88.26%) |
| Proposed Cutoff Score | STO cutoff ≥ 8 | STO cutoff ≥ 13 | STO cutoff ≥ 10 | STO cutoff ≥ 13 | STO cutoff ≥ 8 | STO cutoff ≥ 14 |

Table 5. Proposed STO cutoffs for PTSD/CPTSD for the whole sample (n= 2524)

|  |  |  |
| --- | --- | --- |
|  | African countries (n = 2524) | |
|  | ICD-11 PTSD criteria | ICD-11 CPTSD criteria |
| Statistics for STO |  |  |
| Sensitivity | 69.57% (95% C.I. 65.19%-73.71%) | 78.80% (95% C.I. 74.47%-82.70%) |
| Specificity | 59.29% (95% C.I. 56.87%-61.67%) | 81.31% (95% C.I. 79.34%-83.16%) |
| Positive Predictive Value | 32.70% (95% C.I. 30.89%-34.56%) | 50.56% (95% C.I. 47.75%-53.37%) |
| Negative predictive Value | 87.27% (95% C.I. 85.60%-88.77%) | 94.05% (95% C.I. 92.89%-95.03%) |
| Accuracy | 61.56% (95% C.I. 59.46%-63.64%) | 80.82% (95% C.I. 79.05%-82.50%) |
| Proposed Cutoff Score | STO cutoff ≥ 9 | STO cutoff ≥ 13 |