

# Posttraumatic growth buffers the impact of trauma centrality on health-related quality of life among people living with HIV/AIDS

Joy I. Ugwu<sup>1</sup>, Ebele E. Nnadozie<sup>1</sup>, Nneoma G. Onyedire<sup>1</sup>, and Desmond U. Onu<sup>1</sup>

<sup>1</sup>Department of Psychology, University of Nigeria, Nsukka, Enugu state, Nigeria.

## ARTICLE INFO

### Keywords:

Event Centrality  
Health-Related Quality of Life  
HIV/AIDS  
Posttraumatic Growth

## ABSTRACT

There is evidence that beyond physical ailments, thinking patterns could influence health outcomes. In line with autobiographical memory model, we considered, in this study, if centralization of HIV/AIDS and its treatment condition around one's self concept and identity will predict health-related quality of life (HRQoL). We also considered if Posttraumatic growth (PTG) will moderate the relationship between event centrality (EC) and HRQoL. HIV/AIDS patients (n = 174) receiving treatment from a public hospital in South East Nigeria completed measures of event centrality, posttraumatic growth, and HRQoL. We analysed for the associations with 4 different dimensions of HRQoL (physical, relationship, cognitive and treatment impact). EC was negatively associated with the cognitive, relationship, and treatment impact aspects of HRQoL. Furthermore, results showed that in the presence of high level of PTG, the relationship between EC and HRQoL on the cognitive, relationship and treatment impact dimensions became positive. Hence this study provides evidence that experience of personal growth, as an aftermath of adversity, can be an effective coping mechanism, buffering the impact of EC on the HRQoL among PLWHA.

## Introduction

HIV/AIDS diagnosis and treatment process are often traumatic to patients (American Psychiatric Association, APA, 2000). So much is the HIV burden that people living with HIV (PLWH) have been found to have poorer quality of life (QoL) when compared to patients living with other chronic illnesses (Hays et al., 2000). Traumatic experiences usually have significance in the victim's life story (Reiland & Clerk, 2017). However, PLWH and other traumatic conditions vary in the way they perceive their diagnosis/health status, which also has an impact on their QoL. Some patients tend to fixate their identities and lives around their medical diagnosis/living with the disease, a condition that has been termed event/trauma centrality.

On the other hand, some victims of trauma are known to advance from their circumstances with life improving qualities, a phenomenon termed posttraumatic growth. In the current study, our aim is to examine how event centrality and posttraumatic growth contributes to the health-related QoL (HRQoL) of HIV patients. HRQoL is of interest to researchers, policy makers and health practitioners, given its relevance in the assessment of patients with different health conditions towards understanding their health needs for improved health outcome planning (Osoba, 2011). Assessing HRQoL involves determining how to what extent a disease and/or its therapy are associated with different dimensions of living (including physical, social/role, psychological/emotional, cognitive functioning, symptoms, health perceptions, and overall quality of life), deemed important to people (American Thoracic

Society, ATS, 2008).

Event/trauma centrality (EC) refers to the extent to which victims of traumatic experience(s) think of themselves, either partly or exclusively, as ones who have had such experience(s) which forms the basis for making meaning towards other events (Berntsen & Rubin, 2007; Groleau et al., 2013). EC has been implicated in processes culminating in negative health outcome in a Brazilian sample (Da Silva et al., 2016). Quinn and Chaudoir (2009) identified centrality of one's identity around HIV status to be associated with poorer wellbeing among PLWH in the United States of America. Brener et al. (2013) similarly reported HIV centrality to be associated with worsening health and well-being in an Australian sample. Onu et al. (2019) also found high EC score to be associated with poor HRQoL in a Nigerian sample of PLWH.

Studies have equally shown that PLWH may develop personal positive psychological change known as post traumatic growth (PTG) after passing through the trauma of being diagnosed with HIV/AIDS (Tedeschi & Calhoun, 1996; Onu et al., 2019). PTG is defined as a subjective experience of positive psychological change, reported by an individual as a consequence of struggling with stressful life events, trauma, or highly-challenging life situations (Tedeschi & Calhoun, 2004). PTG manifests in improved personal relationships, higher appreciation of life, increased spirituality, identification of new possibilities, and increased personal strength. One intervention targeting PLWH reported that fostering PTG improved wellbeing of patients (Ye et al., 2018). Despite its positive

characteristics, PTG has yielded conflicting results in relation to HRQoL. For example, Tanyi et al. (2014) found a positive relationship between PTG and family/social well-being domain of HRQoL and negative relationship between PTG and physical wellbeing domain of HRQoL. Yi et al. (2015) also reported that higher PTG scores predicted higher score on social/family well-being domain of the HRQoL among stomach cancer survivors. While Siqveland et al. (2015) reported that PTG was not related to quality of life among tsunami survivors.

Inconsistencies across studies on the role of PTG spur us to reason that other factors may be influencing how PTG relates to health outcomes. Studies (e.g., Kunst et al., 2010; Morrill et al., 2008; Park et al., 2010; Siegel & Schrimshaw, 2007; Sheline, 2013; Siqveland et al., 2015; Teixeira et al., 2013) have found that PTG moderate the relationship between psychosocial antecedents and QoL/health outcomes. Siqveland et al. (2015) found that tsunami survivors who scored high on a posttraumatic stress symptoms measure did not experience lower quality of life if they were also experiencing high PTG, while those whose scores were low on a measure of depression experienced higher quality of life only if their scores were also high on a measure of PTG. If EC is strongly linked to negative health outcomes, and PTG is a possibility among traumatised people, we suggest that PTG could moderate the relationship between EC and HRQoL. Our hunch is that patients who strongly define themselves by their HIV diagnosis or status and also report stronger growth/positive view of life post-diagnosis will likely report poorer HRQoL.

Specifically, we hypothesized that (1) high EC will be associated with lower HRQoL in the physical health, cognitive, relationship and treatment impact symptoms domains. (2) High PTG will be associated with high HRQoL in the physical health, cognitive, relationship and treatment impact symptoms domains. (3) Those with higher EC will report lower HRQoL in the physical health, cognitive, relationship and treatment impact symptoms subscales only (or especially) if lower in PTG. As there currently exist paucity of literature on HIV/AIDS and mental health in sub-Saharan Africa where over 70% HIV/AIDS cases are currently found (Breuer et al., 2011), this study will make important contribution to the global literature. Investigating such interactions have been also recommended by researchers in medical settings (e.g., Farber et al., 2014), given the potential contribution of such finding in addressing HIV/AIDS-related outcomes.

## Method

### Participants

Participants were 174 outpatients (67.2% female) managed for HIV/AIDS in a public hospital in Nigeria. One hundred and thirty-eight (79.3%) participants had minimum Senior School Certificate educational level while 36 (20.7%) had minimum HND educational level. Most participants (64.4%) were married and lived with their spouses while 20.7% were never married. Widows were 16 (9.2%) while widowers were 4 (2.3%). Six of the respondents (3.4%) were divorced.

In terms of occupational status, 56 (32.2%) were self-employed, 42 (24.1%) were employed in the public sector, 36 (20.7%) were employed in the private sectors, 14 (8%) were farmers, 9 (5.2%) were students, 6 (3.4%) were retired, while 10 (5.7%) were unemployed. Also 149 (85.6%) of the participants reported no other sicknesses other than HIV/AIDS while 24 (13.8) reported other sicknesses such as diabetes, ulcer and cancer.

### Instruments

#### *Centrality of Events Scale (CES)*

The CES (Berntsen & Rubin, 2007) was developed to assess the extent to which an event is viewed to be central to one's identity. Developers of the scale reported alpha reliability of .88. We found an alpha coefficient of .82 when responses on the scale was subjected to item analysis.

#### *Posttraumatic Growth Inventory-Short Form (PTGI-SF)*

PTGI-SF is a 10-item scale developed by Cann et al. (2010) to assess positive life changes resulting from traumatic experience known as post traumatic growth. Developers reported a minimum alpha reliability of .63 across all domains, and adjusted correlation of .90 with the original 21-item PTGI. We found a minimum alpha reliability of .61 across all domains. The PTGI-SF global score was used to measure PTG in the current study.

#### *Patients Reported Outcome Quality of Life-HIV (PROQOL-HIV)*

PROQOL-HIV is a 38-item-four domain questionnaire developed by Duracinsky et al. (2012) to assess HRQoL specifically for PLWH. The four domains include: Physical symptoms, (measuring extent of patients' ability to engage in physical activities) relationship to others (intimate/social relationship), (measuring extent of patients' social interaction) cognitive symptoms, (measuring extent of patient's anxiety and depression) and treatment impacts (measuring extent of patients' adherence to treatment regimen and side effects of HIV/AIDS drugs). Developers reported minimum alpha reliability of .77 across all domains. The present researchers also reported a minimum alpha reliability of .77 across all domains of the PROQOL.

### Procedure

Ethical approval was given by the Bishop Shanahan Hospital ethical research committee. Two research assistants were recruited and trained to assist in the administration of the questionnaires. Participants were patients who came for treatment in the hospital and volunteered to participate when they were approached by the research team. Participants were assured of the confidentiality of their personal information. They were encouraged to honestly respond to the test items.

## Design/Statistics

Cross-sectional design was adopted in the study. Pearson's correlation ( $r$ ) analysis was conducted among the study's demographic variables, predictors and dependent variables. While three multiple regression analysis using PROCESS Macro for SPSS, (Hayes, 2013, 2014) was applied for hypothesis testing. Significant interactions were followed up with simple slope analysis (Aiken & West, 1991).

## Results

Pearson's partial correlation in Table 1 indicated that controlling for demographic factors (gender, age, marital status, occupation, level of education) and comorbidity of other sicknesses, EC was negatively related to cognitive symptoms domain of HRQoL. Those who reported centralizing HIV/AIDS around their life were also likely to report more mental health distress. However, other demographic variables were not related to HRQoL.

$t = -3.0, p < .01$ ), cognitive ( $\beta = -.21, t = -4.61, p < .001$ ), and treatment impact ( $\beta = -.86, t = -2.71, p < .01$ ) dimensions of HRQoL. This suggests that EC is associated with poorer QoL outcomes at least in the areas of intimate and social relationships, mental health, and treatment impact. PTG predicted relationship ( $\beta = 3.57, t = 9.22, p < .001$ ) and cognitive symptoms ( $\beta = 3.63, t = 9.70, p < .01$ ), suggesting that PTG is associated with improved relationship with significant others as well as improved mental health among PLWH. The model depicting the interaction of EC and PTG showed a positive prediction for cognitive ( $\beta = .24, t = 3.74; p < .001$ ) and relationship ( $\beta = .21, t = 3.60, p < .001$ ), and treatment impact ( $\beta = .94, t = 2.15; p < .05$ ).

In examining the interaction, the negative relationship between EC and the relationship dimension of HRQoL changed to positive relationship as PTG strengthened ( $\beta = .03, CI = -.05, -.11$ ). Seemingly, stronger PTG development could

**Table 1: Correlations between demographic variables, EC and HRQoL (physical health symptoms domain, health concerns and mental distress domain, intimate and social relationship domain and treatment impact dimensions)**

Variables	1	2	3	4	5	6	7	8	9	10
1. Age		-.29**	.84	.19**	.32**	.04	-.09	-.01	-.05	.02
2. Gender			-.10	-.21**	-.10	-.15*	.04	-.04	-.06	.09
3. Education				-.08	.14*	.02	-.04	.06	-.01	.09
4. Occupation					.12	.01	.10	.01	.11	.08
5. Comorbidity						.03	.01	.07	.01	.09
6. Event centrality							.05	-.45**	-.38*	-.13*
7. Physical health								.13	-.12	.10
8. Relationship									.07	.38**
9. Cognitive health										.04
10. Treatment impact										

Note. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

EC was negatively related to intimate/social relationship and treatment impact dimensions of HRQoL. Hence patients who strongly define themselves by their diagnosis tend to have the poor relationships with others and also perceive their treatment regimen less favorably. EC was not found to be significantly associated with physical health symptoms dimension of HRQoL.

Table 2 features a regression/moderation model predicting the 4 dimensions of HRQoL (physical, relationship, cognitive and treatment impact dimensions) from PTG, EC and the interaction of PTG and EC. Again, as with the correlation table, none of the predictors (EC, PTG & their interactions) predicted the physical symptoms of HRQoL. However, EC significantly but negatively predicted relationship ( $\beta = -.11, t =$

overshadow or thwart the negative identity adopted by PLWH. It should be noted that when PTG was low ( $\beta = -.26, CI = -.39, -.13$ ) there was still a negative and non-significant relationship between EC and relationship. Concerning the mental health dimension of HRQoL, the negative association between EC and mental health was at its highest point at the low level of PTG ( $\beta = -.37, CI = -.52, -.22$ ) and lowest point at the high level of PTG ( $\beta = -.02, CI = -.14, .02$ ). This subtly suggests that relationships with others improved as PTG became stronger. Again, on treatment impact, the negative association between EC and HRQoL was strongest when PTG was low ( $\beta = -1.42, CI = -2.43, -.41$ ), and weakest when PTG was high ( $\beta = -.31, CI = -.88, .30$ ). This suggested that EC was associated with poorer experiences related to the treatment of HIV/AIDS especially

**Table 2: Hayes regression-based process results for moderating role of PTG on the relationship between EC and Physical, relationship, cognitive and treatment impact symptoms domains of HRQoL**

Variables	Physical health			Relationship			Mental health(cognitive)			Treatment impact		
	$\beta$	<i>t</i>	CI	$\beta$	<i>t</i>	CI	$\beta$	<i>t</i>	CI	$\beta$	<i>t</i>	CI
PTG	-3.19	-.87	-10.01, 3.90	3.36	<b>8.11**</b>	2.52, 4.11	3.63	<b>9.70*</b>	2.89, 4.36	-3.91	-1.74	-8.31, .52
EC	.16	.34	-.74, 1.05	-.13	<b>-3.2*</b>	-.21, -.05	-.21	<b>-4.61***</b>	-.30, -.12	-.85	<b>-2.71*</b>	-1.51, -.23
PTG X EC	-.52	-.81	-1.88, .72	.23	<b>3.7**</b>	.11, .36	.24	<b>3.65***</b>	.10, .11	.84	<b>2.15*</b>	.01, 1.67

Note. EC = event/trauma centrality; PTG = Posttraumatic growth; Relationship symptoms = Intimate/social relationship; Cognitive symptoms = health concern/mental distress; \*\*\**p*<.001; \*\**p*<.01; \**p*<.05; CI = confidence intervals (95%).

when PLWH barely experience positive psychological change in their efforts to cope with the trauma of living with HIV/AIDS.

**Discussion**

This study examined the moderating influence of PTG on the relationship between EC and HRQoL in a sample of PLWH in Nigeria. Assessment and maintenance of quality of life (QoL) of patients living with chronic illnesses, such as HIV/AIDS, is one of the priorities of health care practitioners for reasons which include allocation of resources and evaluation of impacts of treatment packages (Reis et al., 2012). Consistent with previous researches (e.g., Brener et al., 2013; Da Silva et al., 2016; Park et al., 2011; Quinn & Chaudoir, 2009), it was found that EC significantly predicted domains of HRQoL. Specifically, we found that intensified thoughts about being diagnosed, and living with HIV/AIDS predicted all but the physical health dimension of the HRQoL. Thus, hypothesis 1 which stated that EC will negatively predict all the domains of HRQoL was, somewhat supported. Park et al. (2011), similarly, found that EC was not significantly related to physical health symptom domain of HRQoL. Onu et al. (2019) suggested that EC may be more related to the mental aspects of wellbeing than the physical aspect. Our finding is in line with the autobiographical memory model of PTSD which stated that over integration of traumatic event around one’s memory, results in easy accessibility of the traumatic event, culminating in poor mental health outcome (Berntsen & Rubin, 2006).

In contrast to EC, and as hypothesized, PTG positively predicted the relationship, mental health and treatment impact dimensions of HRQoL. More importantly, we found that PTG moderated the relationship between EC and treatment impact domain of HRQoL. It seemed that PTG buffered the negative effects of EC on HRQoL. Clearly, we can narrate and speculate from our findings that when patients strongly define themselves by their HIV status, they tend to have poorer QoL, but advancing from the disease with a more positive perspective in living could diminish, nay eliminate the deleterious influence of EC. PTG may be considered a (self-management) coping mechanism or process that can be fostered in PLWH to overcome the mental burden associated with the disease and improve wellbeing. Fostering PTG among PLWH could be

helpful among health practitioners targeting to reduce experiencing side effects of HAART and medical adherence among patients.

In conclusion, our study demonstrated the importance of PTG in understanding the pathway to favourable health outcomes. PTG seems to be more consistently linked to positive health outcomes, buffering the deleterious influence of EC on well-being. Clinical practitioners rendering psychosocial/counselling services to PLWHA could be more sensitive to the level of development of personal positive experiences emanating from the trauma of being diagnosed with HIV/AIDS. These personal positive experiences could be helpful in ameliorating the negative impacts of EC in different spheres of their wellbeing. Our findings suggest that positive personal experiences resulting from trauma of HIV/AIDS diagnosis may result in better wellbeing among people who have strongly defined themselves by their HIV/AIDS illness.

However, our study is not without some limitations. This includes relatively small sample size which may limit the generalizability of our result. Also, the design of this study is cross-sectional, and involved the use of self-report measures in data collection, which precludes causal inferences and raise concerns about impression management. Longitudinal data is therefore recommended in the future study regarding EC, HRQoL and their relationship pathways. Nonetheless, this study supports and extends the existing literature on the relationship between EC and HRQoL among PLWHA. This is especially important in Nigerian setting where the second largest HIV/AIDS burden, globally, is recorded (UNAIDS, 2016).

**References**

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: American Psychiatric Publishing.

American Thoracic Society (2008). Quality of life resource. Retrieved from <http://qol.thoracic.org/>

Berntsen, D., & Rubin, D. C. (2007). When a trauma becomes a key to identity: Enhanced integration of trauma memories predicts posttraumatic stress disorder symptoms. *Applied Cognitive Psychology*, 21, 417–43.

- Boals, A., & Schuettler, D. (2011). A double-edged sword: Event centrality, PTSD and posttraumatic growth. *Applied Cognitive Psychology, 25*, 817-822. doi: 10.1002/acp.1753
- Boals, A., Steward, J. M. & Schuettler, D. (2010). Advancing Our Understanding of Posttraumatic Growth by Considering Event Centrality. *Journal of Loss and Trauma: International Perspectives on Stress & Coping, 15*(6), 518-533.
- Boarts, J. M., Buckley-Fischer, B. A., Armelie, A. P., Bogart, L. M., & Delahanty, D. L. (2009). The impact of HIV diagnosis-related vs. non-diagnosis related trauma on PTSD, depression, medication adherence, and HIV disease markers. *Journal of Evidence-Based Social Work, 6*(1), 4–16. doi:10.1080/15433710802633247
- Brener, L., Callander, D., Slavin, S., & de Wit, J. (2013). Experiences of HIV stigma: The role of visible symptoms, HIV centrality and community attachment for people living with HIV. *AIDS Care, 25*(9), 1166 – 1173. doi:10.1080/09540121.2012.752784
- Breuer, E., Myer, L., Struthers, H., & Joska, J. A. (2011). HIV/AIDS and mental health research in sub-Saharan Africa: A systematic review. *African Journal of AIDS Research, 10*(2), 101-122.
- Cann, A., Calhoun, L. G., Tedeschi, R. G., Taku, K., Vishnevsky, T., Triplett, K. N., & Danhauer, S. C. (2010). A short form of the Posttraumatic Growth Inventory. *Anxiety Stress Coping, 23*(2), 127-137. doi: 10.1080/10615800903094273.
- Da Silva, T. L. G. Donat, J. D. Lorenzonni, P. L. De Souza, L. K., Gauer, G., & Kristensen, C. H. (2016). Event centrality in trauma and PTSD: relations between event relevance and posttraumatic symptoms. *Experimental Psychology Research, 29*. <http://dx.doi.org/10.1186/s41155-016-0015-y>
- Duracinsky, M., Lalanne, C., Le Coeur, S., Herrmann, S., Berzins, B. Armstrong, A. R., Lau, J. T. F., Fournier, I., & Chassany, O. (2012). Psychometric validation of the PROQOL-HIV questionnaire, a new health-related quality of life instrument—Specific to HIV disease. *Epidemiology and Prevention, 59*(5), 506-515.
- Farber, E. W., Lamis, D. A., Shahane, A. A., & Campos, P. E. (2014). Personal meaning, social support, and perceived stigma in individuals receiving HIV mental health services. *Journal of Clinical Psychology in Medical Settings, 21*(2), 173–182.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics: And sex and drugs and rock ‘n’ roll*. London: Sage.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Press.
- Hayes, A. F. (2014). Comparing conditional effects in moderated multiple regression: Implementation using PROCESS for SPSS and SAS. Retrieved from <http://www.afhayes.com/public/comparingslopes.pdf>
- Hays, R. D., Cunningham, W. E., Sherbourne, C. D., Wilson, I. B., Wu, A. W., Cleary, P. D., McCaffrey, D. F., Fleishman, J. A., Crystal, S., Collins, R., Eggan, F., & Shapiro, M. F. (2000). Health-related quality of life in patients with human immunodeficiency virus infection in the United States: Results from the HIV Cost and Services Utilization Study. *American Journal of Medicine, 15*(108), 714-722.
- Kunst, M. J. J., Winkel, F. W., & Bogaerts, S. (2010). Posttraumatic growth moderates the association between violent revictimisation and persisting PTSD symptoms in victims of interpersonal violence: A six-month follow-up study. *Journal of Social and Clinical Psychology, 29*(5), 527-545.
- Morrill, E. F., Brewer, N. T., O’Neill, S. C., Lillie, S. E., Dees, E. C., Carey, L. A., & Rimer, B. K. (2008). The interaction of post-traumatic growth and post-traumatic stress symptoms in predicting depressive symptoms and quality of life. *Psychooncology, 17*, 948–953.
- Nilsson, E. (2012). *Aspects of health-related quality of life: Associations with psychological and biological factors, and use as patient reported outcome in routine health care (PhD dissertation)*. Linköping. Retrieved from <http://urn.kb.se/resolve?urn=urn:nbn:se:liu:diva-74758>
- Onu, D. U., Ugwu, D. I., & Orjiakor, C. T. (2019). Events centrality moderates the relationship between posttraumatic growth and health-related quality of life among people living with HIV. *Journal of the Association of Nurses in AIDS Care, 30*(6), 668-674.
- Osoba, D. (2011). *Health related quality of life and cancer clinical trial*. *Therapeutic Advances in Medical Oncology, 2*, 57–71. doi: 10.1177/1758834010395342.
- Park, C. L., Blank, C. J., & Thomas, O. (2010). Post-traumatic growth: Finding positive meaning in cancer survivorship moderates the impact of intrusive thoughts on adjustment in younger adults. *Psycho-Oncology, 19*(11), 1139-1147.
- Paschoal SMP (2000). *Quality of life for the elderly: building an instrument that privileges their opinion*. Master’s Thesis, Universidade de São Paulo.
- Quinn, D. M., & Chaudoir, S. R. (2015). Living with a concealable stigmatized identity: The impact of anticipated stigma, centrality, salience, and cultural stigma on psychological distress and health. *Stigma and Health, 1*(S), 35–59. doi:10.1037/2376-6972.1.s.35
- Reiland, S.A., & Clark, C.B. (2017). Relationship between event type and mental health outcomes: Event centrality as mediator. *Personality and Individual Differences, 114*(1), 155–159. doi: 10.1016/j.paid.2017.04.009

- Reis, R.K., Santos, C.B., & Gir, E., (2012). Quality of life among Brazilian women living with HIV/AIDS. *AIDS Care*, 5, 626-634.
- Schipper, H., Clinch, J. J., & Olweny, C. L. M (1996). Quality of life studies: Definitions and conceptual issues. In B. Spilker (Ed.), *Quality of life and pharmacoeconomics in clinical trial* (2nd ed.) (pp. 11–23). New York: Lippincott-Raven.
- Sheline, K. T. (2013). The moderating role of posttraumatic growth on suicide risk among trauma exposed undergraduate students. MSc thesis. Colorado State University Fort Collins, Colorado.
- Siegel, K., & Schrimshaw, E. (2007). The stress moderating role of benefit finding on psychological distress and well-being among women living with HIV/AIDS. *AIDS and Behavior*, 11, 421-433.
- Siqveland, J., Nygaard, E., Hussain, H., Tedeschi, R. G., & Heir, T. (2015). Posttraumatic growth, depression and posttraumatic stress in relation to quality of life in tsunami survivors: A longitudinal study. *Health and Quality of Life Outcomes*, 13, 18-25. doi: 10.1186/s12955-014-0202-4.
- Tanyi, A. B., Szluha, K. Z., & Nemes, S. KA. B., (2014). Health-related quality of life, fatigue, and posttraumatic growth of cancer patients undergoing radiation therapy: A longitudinal study. *Applied Research Quality Life*, 9(3), 617-630. doi:10.1007/s11482-013-9261-7
- Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress*, 9, 451–471.
- Tedeschi, R. G., and Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological Inquiry*, 15, 1–18.
- Teixeira, R. J., Grac, M., & Pereira, A. (2013). Factors contributing to posttraumatic growth and its buffering effect in adult children of cancer patients undergoing treatment. *Journal of Psychosocial Oncology*, 31, 235–265.
- UNAIDS (2016). The Global AIDS Response Progress Report. [http://files.unaids.org/en/media/unaids/coentassets/documents/unaidspublication/2016/UNAIDS\\_Gap\\_report\\_en](http://files.unaids.org/en/media/unaids/coentassets/documents/unaidspublication/2016/UNAIDS_Gap_report_en).
- Ye, Z., Yu, N. X., Zhu, W., Chen, L., & Lin, D. (2018). A randomized controlled trial to enhance coping and posttraumatic growth and decrease posttraumatic stress disorder in HIV-Infected men who have sex with men in Beijing, China. *AIDS Care*, 30(6), 793 - 801.
- Yi, J., Zebrack, B., Kim, M. A., & Cousino, M. (2015). Posttraumatic growth outcomes and their correlates among young adult survivors of childhood cancer. *Journal of Pediatric Psychology*, 40(9), 981-991. doi: 10.1093/jpepsy/jsv075