ORIGINAL ARTICLE

Effects of Gender Based Violence on Neurocognitive functioning in HIV positive individuals

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ABSTRACT

Background: Gender based violence is being recognized as a global problem[1]. Given the rampant trends of violence against women and girls in Zambia which include battery, sexual abuse and exploitation, sexual cleansing, assault and other forms of violence[2], women are prone to increasingly mental health problems.

Methodology: This was a cross sectional survey study ccomprising of 263 HIV+ adults aged between 20 and 65. An International Neurobehavioral Test Battery (INTB) was used to review the effects of GBV on neurocognitive functioning among HIV positive individuals in Lusaka's selected urban clinics.

Results: Respondents who experienced GBV showed cognition deficits in working memory, verbal learning and recall. Pearson's correlation test showed a negative correlation on both psychological and sexual abuse on working memory r (263) = -.19, p = .002; r (263) = -.16, p = .008 and verbal learning r (263) = -.15, p = .018; r (263) = -.17, p = .006 respectively. On recall memory tests, only sexually abused respondents indicated significant negative correlation, r = -.12, n = 263, p = .044.

Conclusion: The finding of the present study suggests that GBV and depressive symptoms are independent predictors of neurocognitive deficits in HIV positive women in Zambia.

INTRODUCTION

Gender-based violence (GBV) is "the general term used to capture violence that occurs as a result of the normative role expectations associated with each gender, along with the unequal power relationships between the two genders, within the context of a specific society[3].

Some of the adverse health effects of gender-based violence include physical injury, chronic pain, gynaecological morbidity, obesity, hypertension, smoking, and sexually transmitted diseases including HIV[4]. Investigators have increasingly documented mental health consequences (e.g., posttraumatic stress syndrome, depression, anxiety, and low self-esteem) of gender based violence[5]. Women who are subjected to sexual and/or physical abuse have increased levels of anxiety[6].

In Zambia, almost half (47% of 5,236) of women interviewed reported to have had experienced physical violence since they were 15 years old[7]. Recent Zambia Police Service Annual Crime Returns of 2008, 2009, 2010 and 2011 shows a drastic increase in reported GBV cases of 8147, 8261, 8467 and 11980 respectively.

Despite such high prevalence of gender-based violence in Zambia as evidenced from Zambia Police Service Annual Crime Returns (2008-2011) and emerging literature documenting associations of increased mental health disorders among abused women, little epidemiological research has focused on the mental health effects of GBV. It was not clear yet, how the vice affected neurocognitive functioning and consequently impacted on the life style of its victims.

METHODS

Study design and sampling: An International Neurobehavioral Test Battery (INTB) was used in a

Key words: *Gender Based Violence, Neurocognitive functioning, HIV positive individuals*

cross-sectional survey which provided quantitative descriptions to review the effects of GBV on neurocognitive functioning among HIV positive individuals.

The study population comprised of HIV+ adults aged between 20 and 65 years with a minimum of 5years education level. Convenience sampling was used to select 263 participants, of which, 107 were males while 156 were females.These participants were recruited from six selected ART clinics in Lusaka namely; Matero Ref., Matero main, Kabwata, Chilenje, Kalingalinga and Chipata clinic between October and December 2012. Both male and female participants were recruited and efforts were made to ensure equal participation from both gender.

PROCEDURE

The data was collected by 10 student researchers pursuing Msc. in Clinical Neuropsychology as an umbrella study between October and mid December 2012.Six health centres were selected with permission and directives from the District Health Management Boards (DHMB) in Lusaka province. Once permission was obtained from DHMB and health centres identified, potential participants were identified from ART clinics with the help of health practitioners. After identification of potential participants, the researcher explained what the research was all about.Participant's consent was obtained through the consent form, which was read and ensured that they understood. Those that consented by signing underwent laboratory investigations as a screening procedure to verify with their CD4 count and viral load. Given the fact that Zambia is in a resource constrained setting, WHO clinical staging system was used to establish the stage of the illness. The clinical stages are categorized from stage 1 through stage 4, reflecting progression from primary HIV infection to advanced HIV/AIDS.

INSTRUMENTS

Demographic Information

A self-administered questionnaire was used to collect information concerning social characteristics and demographic information. To identify and screen for recent GBV victims, questions from the *WHO Multi-country Study of Violence against Women* were adapted for use in this study. The questionnaire used for the WHO study was developed and validated for use in Ethiopia, Namibia and eight other countries[8]. Questions were formulated so that participants could report whether they have been physically and psychologically abused such as; slapped, punched, or beaten; kicked or dragged; and choked or burnt, or whether they had been sexually abused such as being forced in any way to have sexual acts with an intimate partner or any other person of opposite sex when they did not want to in their life time.

I*nternational Neurobehavioral Test Battery*

This research will use an International Neurobehavioral Test Battery with Zambia norms to measure neuropsychological performance. The test battery consists of 14 tests split into 7 neuropsychological domains namely; The Visual Episodic Domain comprising the Brief Visual Memory Test Revised – Learning and delayed recall; The Verbal Episodic Domain comprising the Hopkins Verbal Learning Test Revised – learning and delayed recall; The Verbal Fluency Domain comprising the Controlled Word Association Test – FAS, Category Fluency Test (Animals and Actions) and the Stroop Word; Speed of Information Processing comprising Trail Making Test Part A, Colour Trails One, WAIS Digit Symbol, WAIS Symbol Search and Stroop Colour; The Executive Functioning Domain comprising the Colour Trails 2, Halstead Category Test, Wisconsin Card Sorting Test and Stroop Colour – Word; The Working Memory and Attention Domain comprising the Paced Auditory Serial Addition Test and the Spatial Span; and The Motor Dexterity Domain comprising the Grooved Pegboard Test, dominant and non-dominant hand.

Participant information and informed consent form

This was a written information and consent form which stated the purpose of the study, the need for participants' involvement, issues pertaining to ethics and confidentiality. The form also elicited information that the respondents had agreed to be part of the study. Prior to the administration of all parameters, the willingness of

the subjects to participate in the study was ascertained and they were made to sign the consent form.

Ethical considerations

The research was reviewed and approved by the Ministry of Health and Biomedical Ethics Committee.A standard consent form with an information sheet regarding the research was given to all participants. A written consent was obtained from the participants before their participation. At any time in the course of the testing procedure, participants were free to indicate if they needed to take a break. All personal identifying information was kept confidential and the data sheets were kept in secured lockers.

Data Analysis

The software Statistical Package for Social Sciences version 16 (SPSS-V16) was used to analyse quantitative data. In order to determine whether GVB was a predictor of poor performance on NP tests, Pearson product-moment correlation coefficient was used. To ascertain the extent to which GBV experiences influenced the NP performance, a two-way analysis of variance (ANOVA) was used. The student's t-test was used for comparison of GBV scores and Global Deficit Score means on gender, age and education.

RESULTS

Correlation of GBV and performance on cognitive domains

The relationship between GBV (psychological and sexual abuse) and performance on neuropsychological test as determined by GDS was investigated using Pearson product-moment correlation coefficient. The results indicated significant negative correlation between psychological abuse and sexual abuse on working memory r (263) = -. 19, p = .002; r (263) = -.16, p = .008; learning memory r (263) = -.15, p = .018; r (263) = -.17, p = .006. On recall memory only sexual abuse indicated significant negative correlation, r = -.12, n = 263, p = .044. Those who reported high experiences on psychological and sexual abuse performed poorly indicating impairment on cognitive tests for working memory and learning memory. However, only those who reported sexual abuse performed poorly on recall memory.

Table 12: Effect size of GBV on Neurocognitive Functioning.

Tests of Between -Subjects Effects						
Source	Dependent Variable	df	Mean Square	F	Sig.	Partial Eta Squared
Psychabu	wrkmemmean_T	26	89.268	1.359	.125	.155
	learn mean T	26	56.456	.859	.666	.104
	recall mean T	26	45.918	.694	.864	.086
Sexuabu	wrkmemmean_T	9	83.329	1.269	.256	.056
	learn mean_T	9	40.997	.624	.776	.028
	recall mean_T	9	26.063	.394	.937	.018
psychabu *	wrkmemmean T	34	48.640	.741	.850	.115
sexuabu	learn mean T	34	80.048	1.218	.205	.177
	recall mean_T	34	78.459	1.187	.235	.173

Correlations				
		global mean_T	Psych. abuse	Sexual abuse
wrkmemmean_T	Pearson Correlation	.637 **	-.192 **	-.164 **
	Sig. (2 -tailed)	.000	.002	.008
	N	263	263	263
learn mean_T	Pearson Correlation	.730 **	-.146 *	-.169 **
	Sig. (2 -tailed)	.000	.018	.006
	N	263	263	263
recall mean_T	Pearson Correlation	.656 **	-.078	-.124 *
	Sig. (2 -tailed)	.000	.207	.044
	N	263	263	263
**. Correlation is significant at the 0.01 level (2 -tailed).				
*. Correlation is significant at the 0.05 level (2 -tailed).				

To ascertain the extent to which GBV experiences influenced the cognitive deficit on working memory, learning and recall memory a two-way ANOVA was run. The results indicate a small size effect on working memory F (34,193) = .741, p = .850, ηp2 = .115; learning F (34, 193) = 1.22, ηp2 = .177; and recall F (34, 193) = 1.19, p = .235, ηp2 = .173. Although GBV (psychological and sexual abuse) experiences had a significant impact on neurocognitive functioning, it did not have clinical effect on NP tests.

Table 14: Effects of Gender on impaired domains.

Independent Samples Test

Group Statistics

	Gender	N	Mean	Std. Deviation
wrkmemmean_T	Male	107	43.584644463E1	8.20709150125E0
	Female	156	45.347217914E1	8.19715332997E0
learn mean_T	Male	107	44.58336041E1	8.5150208454E0
	Female	156	44.14623208E1	7.8950985908E0
recall mean_T	Male	107	45.607649222E1	8.36655253246E0
	Female	156	44.864813723E1	7.84047257933E0

To ascertain the effect of Gender difference on the impaired cognitive domains (working memory, learning and recall memory), an independent-samples t-test was conducted to compare the GDS means. Working memory for males (N = 107, M = 43.58, SD = 8.21) and females (N = 156, M = 45.35, SD = 8.19); t (261) = -1.71, p = .09 (two-tailed); learning memory for males (N = 107, M = 45.61, SD = 8.51) and females (N = 156, M = 44.86, SD = 7.89); t (261) = .43, p = .67 (two tailed) and Recall memory for males (N = 107, M = 4.56, SD = 8.09) and females (N = 156, M = 4.49, SD = 7.84); t (261) = .73, p = .46 (two-tailed). There was no significant gender difference in the scores for the three cognitive domains.

Table: 15 – Effects of Confounding variables on impaired domains

Tests of Between -Subjects Effects

Source	Dependent Variable	df	Mean Square	F	Sig.
Age	wrkmemmean_T	3	166.883	2.572	.055
	learn mean_T	3	83.482	1.443	.231
	recall mean_T	3	93.998	1.653	.178
Edu	wrkmemmean_T	4	26.419	.407	.803
	learn mean_T	4	85.757	1.483	.209
	recall mean_T	4	17.359	.305	.874
maritalstatus	wrkmemmean_T	4	138.365	2.133	.078
	learn mean_T	4	21.703	.375	.826
	recall mean_T	4	37.419	.658	.622
age * edu *	wrkmemmean_T	14	52.485	.809	.659
maritalstatus	learn mean_T	14	76.121	1.316	.200
	recall mean_T	14	57.391	1.009	.446

A further scrutiny was made to explore the possible effects of age, education and marital status as cofounding variables on working memory, learning and recall memory using two-way group analysis of variance. The interaction effect of age, education and marital status was not statistically significant with working memory F (14, 210) = .809, p = .659; learning F (14, 210) = 1.316, p = .200 and recall F (14, 210) = 1.009, p = .446.

DISCUSSIONS

GBV was categorized as psychological and sexual abuse experienced by respondents from intimate partners. Both psychological and sexual abuse was measured as a continuous variable. Respondents with cognitive deficits who experienced psychological abuse had a range of 38 (M = 6. 78, SD = 7.59) while sexually abused had a range of 9 (M = 1.16, SD = 2.11).

On determining GBV's effects on neurocognitive functioning, the results showed a negative correlation on both psychological and sexual abuse on working memory and learning. On recall memory tests, only sexually abused respondents indicated a significant negative correlation. These findings imply that the higher the exposure of GBV to the respondent, the poor their performance on the NP tests. In this study, those who reported high experiences on psychological and sexual abuse performed poorly on working memory and learning, indicating impairment on their neurocognitive functioning in the two domains. However, only those who reported to have been sexually abused by intimate

partners performed poorly on recall memory. These findings were consistent with results from previous studies (Spies et al. 2012).

Given the rampant trends of GBV cases against women as recorded by The Zambia Police Service[9], it is likely that most HIV positive women have deficits in neurocognitive functioning, not to their knowledge. It is also likely that more HIV positive women will be affected as compared to their male counterparts. This would be because more women are victims of GBV especially sexual abuse according to Zambia Police statistics and our findings. Though previous research and this present study reveals that different neurocognitive domains are affected by GBV, the possible explanation could be due to different characteristics of the population sample such as culture and socioeconomic status. A follow up study taking into consideration culture and socioeconomic status as cofounding variables of GBV and their effects on NP tests performance would be important to bridge the information gap especially in our Zambian society. However, as far as the present study shows, it can be generalised that GBV victims are prone to neuropsychological deficit.

STRENGTHS AND LIMITATIONS OF THE STUDY

The findings of the study have to be considered in the methodological strengths and limitations of the study. The major strength of the study is that it was the first one of its nature to look at the neurocognitive effects of GBV experiences on HIV positive individuals in Zambia. A large study sample of 263 was recruited which is good for generalisation. Methodological limitations included limitation in the selection of the clinics to Lusaka's urban area. The tools used to gather demographic information on gender based violence experience were self-reported. Most participants seem to have been harbouring sensitive information in accordance to culture where 'bedroom issues' should not be disclosed anyhow.Finally, there was unequal number of males and females who were recruited, thus making it difficult to appreciate the actual effects gender has on neuropsychological performance.

CONCLUSION

GBV victims showed cognitive deficits in working memory, verbal learning and recall. Therefore it can be deduced that GBV is a predictor of poor performance on neurocognitive functioning.

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