

## ORIGINAL RESEARCH ARTICLE

# Relationships between anti-retroviral adherence, self-efficacy, and resilience among women living with HIV in Niger State, Nigeria

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## Abstract

The objectives of the study were to describe the level of self-efficacy and its relationship with resilience among women living with HIV in Niger State, Nigeria. Self-efficacy is an important predictor of treatment outcomes among people living with HIV. Using a systematic random sampling technique, 676 participants completed adherence self-efficacy and resilience measures from three selected hospitals in Niger State. The result showed high levels of self-efficacy among the participants, linear relationships between perceived stress and resilience (-.601), perceived stress and self-efficacy integration (-.504), perceived stress and self-efficacy perseverance (-.220), resilience and self-efficacy integration (.667) and resilience and self-efficacy perseverance (.377). Hierarchical multiple linear regression indicated that 48.3% of the variance in resilience was explained by the two sub-scales of self-efficacy ( $p < .001$ ). Also, 26% ( $p < .001$ ) of the variance in perceived stress was explained by the two subscales of the self-efficacy. It is concluded that self-efficacy is a significant predictor of resilience and perceived stress among women living with HIV in Niger State, Nigeria. (*Afr J Reprod Health* 2020; 24[3]: 118-125).

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**Keywords:** HIV, Nigeria, Perceived stress, Resilience, Self-efficacy, Women

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## Résumé

Les objectifs de l'étude étaient de décrire le niveau d'auto-efficacité et sa relation avec la résilience chez les femmes vivant avec le VIH dans l'État du Niger, au Nigéria. L'auto-efficacité est un prédicteur important des résultats du traitement chez les personnes vivant avec le VIH. À l'aide d'une technique d'échantillonnage aléatoire systématique, 676 participants ont complété des mesures d'auto-efficacité et de résilience de l'observance dans trois hôpitaux sélectionnés dans l'État du Niger. Le résultat a montré des niveaux élevés d'auto-efficacité chez les participants, des relations linéaires entre le stress perçu et la résilience (-.601), le stress perçu et l'intégration de l'auto-efficacité (-.504), le stress perçu et la persévérance de l'auto-efficacité (-.220), l'intégration de la résilience et de l'auto-efficacité (.667) et la persévérance de la résilience et de l'auto-efficacité (.377). La régression linéaire multiple hiérarchique a indiqué que 48,3% de la variance de la résilience était expliquée par les deux sous-échelles d'auto-efficacité ( $p < .001$ ). De plus, 26% ( $p < .001$ ) de la variance du stress perçu était expliquée par les deux sous-échelles de l'auto-efficacité. Il est conclu que l'auto-efficacité est un prédicteur significatif de la résilience et du stress perçu chez les femmes vivant avec le VIH dans l'État du Niger, au Nigéria. (*Afr J Reprod Health* 2020; 24[3]: 118-125).

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**Mots-clés:** VIH, Nigéria, Stress perçu, Résilience, Auto-efficacité, Femmes

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## Introduction

Factors such as poverty, inequalities in employment and education, internalised pains as well as domestic violence are associated with HIV-related stress among women in sub-Saharan Africa<sup>1</sup>. The situation is worsened among sub-Saharan African women because HIV infection hit them more than any other group<sup>1-2</sup>. In Nigeria, HIV-related stress is associated with poor psychological adjustment in the form of

depression, suicidal ideation and anxiety<sup>3</sup>. Evidence had shown that in Nigeria, women are exposed to AIDS-related stress more than men<sup>4-5</sup>. However, the introduction of antiretroviral therapy (ART) has led to great improvement and transformed HIV infection from a terminal illness to chronic disease. Evidence has shown that the use of ART for people living with HIV (PLWH) is associated with viral load suppression, improved quality of life and better psychological well-being. For this reason, ART remains the only option to

reduce morbidity and mortality among PLWH since it has no cure currently. Although ART adherence is critical in the management of HIV infection, self-efficacy is important in achieving adherence and better treatment outcomes.

Self-efficacy is the belief that individuals hold about their capabilities to exercise control over events that affect their lives<sup>6</sup>. In the context of HIV, adherence self-efficacy represents an individual's belief and confidence to adhere to the ART treatment plan<sup>7</sup>. Self-efficacy is therefore considered an important determinant of motivation, affect and action.

Social cognitive theorists posit that belief about one's ability helps the individual to overcome difficulties associated with a traumatic life event such as HIV-related stress<sup>8</sup>. Similarly, self-efficacious individuals can employ resources such as positive coping strategies to reduce the impact of stress and improve psychological well-being<sup>9-10</sup>. Rather than depleting resources to manage symptoms, self-efficacious individuals utilise their personal and social resources to meet up with the demand for adaptation to traumatic events<sup>8</sup>. Self-efficacy influences how people feel about traumatic experiences; hence it may be a key determinant of stress and resilience in women living with HIV.

Psychological resilience is the ability to function competently following exposure to stressors and/or to achieve positive relational, cognitive and behavioural outcomes and healthy psychological and physical functioning despite adverse experiences<sup>11</sup>. Psychological resilience is an important determinant of maintaining healthy psychological well-being in the face of adversity. Evidence had shown that resilience is associated with reduced psychological stress and better physical and mental health among people living with HIV.

Nursing recognises assisting individuals to adapt adversities associated with disease<sup>12</sup>. This has made the concept of resilience a subject of discourse in nursing literature in recent time. Resilience in the context of HIV is consistently described in the literature as the attainment of a desired emotional adjustment despite the effects of the disease or the ability to adapt despite the difficulty caused by the infection<sup>13-15</sup>. Resilience

studies focus on protective factors that promote positive adaptation in significant adversity rather than psychopathology<sup>16</sup>. The protective or resilience factors can be intrinsic or extrinsic. Intrinsic factors may include a sense of spirituality, hardiness and the desire to survive while the extrinsic factors may include acceptance of diagnosis and self-efficacy<sup>17-18</sup>.

While studies have investigated the relationships between adherence self-efficacy and ART adherence as well as ART adherence and psychological resilience of people living with HIV<sup>18-19</sup>, little is known about the relationships between resilience, ART adherence self-efficacy and perceived stress among WLWH in Nigeria. Research is therefore needed to assess psychological variables that can ameliorate psychological stress and boost resilience among women living with HIV in Sub-Saharan Africa in general and in Nigeria in particular. This is of significance giving that psychological factors are modifiable through psychological interventions to improve mental well-being. We hypothesised that:

1. higher levels of self-efficacy will be positively associated with higher levels of resilience.
2. higher levels of resilience and self-efficacy will be negatively associated with lower levels of perceived stress.

It is important to note that to the best of the knowledge of the researchers in this current study, there were no existing studies that use self-efficacy as a predictor of resilience and perceived stress among women living with HIV in sub-Saharan Africa. Therefore, this study aimed to assess the relationships between resilience, adherence self-efficacy and perceived stress among women living with HIV in Nigeria.

## Methods

A cross-sectional predictive correlational design was used to describe the relationships between ART adherence self-efficacy and psychological resilience among women living with HIV in Niger State, Nigeria.

### *Population and sampling*

The target population for this study was women living with HIV attending three selected hospitals

in Niger State. A systematic random sampling technique was used to recruit the participants. The inclusion criteria were being a woman, diagnosed with HIV for not less than 4 months, being 18 years old and above as well as been enrolled on ART for not less than three months.

In consultation with the school statistician, G\*Power, a Statistical Power Analyses tool for Windows and Mac was used to calculate the sample size<sup>20</sup>. The sample size was 748 and was calculated using the following parameters:

Alpha error (type 1) = 0.05

Beta error (type 2) = 0.2

Statistical power =  $1 - 0.2 = 0.8$

Number of predictors = 5

A systematic random sampling was used to recruit 250, 249 and 249 participants from general hospitals of Minna, Bida and Kontagora respectively. To systematically sample the participants, every third female client that entered the clinics in each of the selected hospitals were approached for participation. Those who agreed to participate were enrolled after informed consent. When a client declined participation, the next client was approached. This process continued until the sample size was reached. The data were collected between 25<sup>th</sup> September, and 24<sup>th</sup> December, 2017.

From a total of 748 questionnaires distributed to women living with HIV across the three selected hospitals, 676 completed the questionnaires giving a return rate of 90.1% which were analysed. Seventy two out of the 748 questionnaires distributed were not returned in useful form. Some were incompletely filled while others had multiple options selected by the respondents. These were therefore not analysed.

### Measure

The HIV Treatment Adherence Self-efficacy Scale, HIV-ASES<sup>7</sup> was used to evaluate ART adherence self-efficacy among the respondents. It measures self-efficacy beliefs regarding adherence to HIV treatment plan, medication, nutrition and exercise in the past month. The questionnaire has been validated and has good psychometric properties. It is a 12 items questionnaire and has questions such as “in the past month, how confident have you been to stick to your treatment even when side effects begin to interfere with daily activities”.

Participants are expected to grade responses in an 11-point Likert's scale ranging from 0-10 where 0 indicates “completely certain cannot do at all” 5 indicates “moderately certain can do” and 10 indicates “completely certain can do”. It has two subscales namely integration and perseverance. Items 1-7, 10 and 11 made up the integration subscale while items 8,9 and 12 made up the perseverance subscale. The Cronbach alpha for the integration and perseverance are 0.92 and 0.90 respectively. Participants will be classified as non-adherent if they report missing at least one pill within the past week<sup>7</sup>. The measure had been used to assess adherence in a multi-country study in Africa<sup>21</sup> as well as among HIV population<sup>22-23</sup>.

The Connor Davidson resilience scale, CD-RISC was used to measure the resilience of the participants<sup>24</sup>. CD-RISC is made up of 23 items rated on a five-point Likert scale of 0-4. Higher scores denote higher perceived resilience. The Cronbach alpha of the scale is 0.7. The scale was developed using multiple samples in different settings including clinical settings and general populations. However, most of the sample was comprised of women.

The Perceived Stress Scale (PSS)<sup>25</sup> was used to measure HIV-related stress in the current study. The PSS consists of 14 items that elicit information from the respondents about their exposure to stressful events. The five-point Likert's scale comprises the following response options: never (0), almost never (1), sometimes (2), fairly often (3) and very often (4).

To obtain the scores in the PSS, the seven positively worded items were reversed and then summing across all the 14 items with greater scores indicating a high level of stress. The scores ranged from 0 to 56. Scores that is 25 and above were considered high stress and scores below 25 were considered moderate to low stress. The coefficient alpha reliability for PSS is 0.85 and the test re-test correlation was 0.85<sup>25</sup>.

### Setting

The study was conducted in three selected hospitals in Niger State Nigeria. Niger State is one of the 33 States in Nigeria. It is located in the the north-central geopolitical region of the country. The State has 25 local government areas

distributed across its three geo-political zones. The major languages spoken in the State are Nupe, Hausa and Gwari.

The study was carried out in three randomly selected hospitals in Niger State namely: Umaru Sanda Ndayako General Hospital Bida, General Hospital Minna and General Kontagora. These hospitals are located each in zone A, zone B and zone C of the State respectively. The three hospitals are public secondary health care facilities and provide care for people living with HIV.

### **Data collection**

The data for this study was collected using a self-report questionnaire. Three trained research assistants were responsible for the data collection. Each participant was administered the HIV Treatment Adherence self-efficacy Scale, the Connor Davidson resilience scale (CD-RISC) and Perceived Stress Scale for completion. The questionnaires were filled and returned on the spot by each participant in a designated office. The participants who required assistance were supported by the research assistants in each of the selected clinics. It took approximately 20 minutes for each participant to complete the questionnaire. Participants who did not mind were offered two hundred naira as transport to compensate their time.

### **Data analysis**

The data analysis was performed using Statistical Package for the Social Sciences (version 25). Descriptive statistics were used to describe the demographic characteristics of the participants, level of perceived stress and level of perceived resilience. Pearson's correlation coefficients and regression analysis were used to examine the relationships between perceived stress and resilience.

## **Results**

### **Demographic characteristics**

The result indicated that most of the respondents Muslims by faith and Hausa by ethnic group. Table 1 summarised the demographic

characteristics of the respondents. The participants in this study expressed high resilience and adherence self-efficacy in the integration subscale. Participants recorded moderate and low scores in perceived stress and adherence self-efficacy perseverance dimensions respectively. The mean scores of resilience, self-efficacy (integration) and self-efficacy (perseverance) were  $60.04 \pm 12.5$ ,  $65.8 \pm 9.3$  and  $18 \pm 6.5$  respectively. The descriptive result of the study variables is summarised in Table 2.

Pearson's correlation analysis was performed to assess the relationship between resilience and the two subscales of adherence self-efficacy. The results indicate a strong positive relationship between resilience measure and the integration subscale of adherence self-efficacy ( $r = .667, p = < .001$ ) as well as moderate positive relationships between resilience and perseverance subscale of the adherence self-efficacy ( $r = .377, p = < .001$ ). Thus, a higher level of ART adherence self-efficacy is associated with a higher level of resilience.

Similarly, Pearson's correlation between perceived stress and the two subscales of the adherence self-efficacy subscales indicated significant negative relationships. The result of the correlations among the variables of the study is summarised in Table 3.

Hierarchical multiple linear regression was used to investigate the ability of two ART adherence self-efficacy subscales to predict the level of resilience after controlling for the influence of age. Age was entered at block 1, which explained 0.4% of the variance in resilience. After entry of the two adherence self-efficacy subscales, the variance explained by the model was 48.7%,  $F(3, 672) = 212, p = < .001$ . The two ART adherence self-efficacy subscale measures explained additional 48.3% of the variance in resilience after controlling for age,  $R^2$  change = .483,  $F$  change (2, 674) = 316,  $p = < .001$ . The two subscales of adherence self-efficacy were statistically significant with the integration subscale recording higher beta value (Beta = .61,  $p = < .001$ ) than the perseverance subscale (.21,  $p = < .001$ ). Table 4 features the summary of the regression analysis.

**Table 1:** Demographic characteristics of respondents (n =676)

Age (mean/SD)	36.90±12.2	
<b>Religion</b>		
Islam	337	49.8%
Christianity	325	48.1%
Others	14	2.1%
<b>Ethnicity</b>		
Hausa	171	25.3%
Nupe	134	19.8%
Gwari	131	19.4%
Others	240	35.5%
<b>Marital Status</b>		
Married	483	71.4%
Single	96	14.2%
Divorced	50	7.4%
Widowed	47	7.0%
<b>Level of Education</b>		
No formal education	207	30.6%
Primary	129	19.1%
Secondary	232	34.3%
Diploma	86	12.7%
Tertiary education	22	3.3%
<b>Employment Status</b>		
Employed	217	32.1%
Unemployed	459	67.9%

**Table 2:** Descriptive result of the study variables

	Mean/SD
Age	36.90±12.2
Perceived stress	26.93±6.3
Resilience	60.04±12.5
Self-efficacy integration	65.8±9.3
Self-efficacy perseverance	18±6.5

**Table 3:** Correlation results of the study variables

	1	2	3	4	5
Age	-				
Perceive stress	-.044				
Resilience	.063	-.601*			
Self- efficacy integration	.028	-.504*	.667*		
Self-efficacy perseverance	.015	-.220*	.377*	.275*	-

\* Correlation is significant at the 0.01 level

Again, hierarchical multiple regression was used to assess the ability of the two Art adherence self-efficacy subscales to predict the level of perceived stress after controlling for the influence of age. Age was entered in block 1, explaining 0.2% of the variance in perceived stress. After the entry of the two ART adherence self-efficacy subscales, the whole variance explained by the model was 26.2%,  $F(3, 672) = 79.5, p < .001$ . Thus, an additional 26% of the variance in perceived stress was

explained by the two subscales of ART self-efficacy after controlling for age,  $R^2$  change = .26,  $F$  change (2, 672) = 118,  $p < .001$ . The integration subscale of the ART adherence self-efficacy had the higher Beta coefficient (Beta = -.48,  $p < .001$ ) while the perseverance subscale had a lower coefficient (Beta = -0.9,  $p < .05$ ). a summary of the regression analysis is presented in Table 5.

## Discussion

The aim of this study was to assess the relationships between self-efficacy, resilience and perceived stress among women living with HIV in Nigeria. The finding of this study showed that the participants had a high level of self-efficacy, especially in the integration dimension. The high self-efficacy in the study may suggest that the participants had self-confidence and positive attitudes towards self-management which may improve psychological well-being. This finding is consistent with the finding of Andini, Yona, Waluyo<sup>26</sup> among WLWH in Indonesia. Nurses, therefore, need to attach significance to measures that can improve patients' self-efficacy such as health education, building patients' self-confidence and involving them in planning as well as implementing their care.

The finding also showed that there was a negative linear relationship between perceived stress and self-efficacy. This finding is similar to a study among WLWH in Indonesia that found a negative association between psychological correlates such as depression and ART adherence self-efficacy<sup>26</sup>. The finding, therefore, suggests that high levels of positive self-efficacy may ameliorate the impact of psychological stress and indirectly boost an individual's psychological well-being. In the study, individuals with higher adherence self-efficacy had lower psychological symptoms. Another evidence had shown that individuals with a higher level of self-efficacy have higher confidence to face adversity, cope with the disease and better attitudes towards therapy<sup>19</sup>. This relationship may directly influence the psychological well-being of individuals with HIV. Further, a higher level of self-efficacy is essential in ART adherence to achieve reduced morbidity and mortality associated with HIV infection<sup>27</sup>.

**Table 4:** Regression analysis of perceived stress and resilience

Variable X	Y	Type of Model	Observations Regression Equation	R <sup>2</sup>	p-value	Inference Strength of Relationships	Remark	Action on Hypothesis
Resilience	Perceived stress	Linear Regression	57.7+0.044+0.815+0.40	48.3%	< 0.001	Strong	Statistically significant	Reject null hypothesis

Dependent variable = Perceived stress

**Table 5:** Regression analysis of perceived stress and adherence self-efficacy

Variable X	Y	Type of Model	Observations Regression Equation	R <sup>2</sup>	p-value	Inference Strength of Relationships	Remark	Action on Hypothesis
Adherence self-efficacy	Perceived stress	Linear Regression	50.5-0.02-0.33 - 0.09	26%	< 0.001	Weak	Statistically significant	Reject null hypothesis

Dependent variable = perceived stress

Higher ART adherence self-efficacy was found to be associated with lower stress and vice versa<sup>28</sup>. Although the current study did not assess the causes of psychological stress among WLWH in Nigeria, evidence has shown that stigma, discrimination, poverty and domestic violence are major stressors among women living with HIV in SSA countries<sup>29</sup>.

The finding of this study also showed that women with higher self-efficacy had a higher level of resilience and lower level of perceived stress. These findings imply that self-efficacy is associated with better psychological well-being of women living with HIV. Evidence has shown that self-efficacy help patients to improve their self-confidence and positive attitudes towards the management of their condition<sup>30</sup>. Based on Bandura's cognitive theory, self-efficacy reflects the belief of being able to control one's environment and positively influencing challenging situations such as stress. According to Bandura<sup>9</sup>, self-efficacious individuals are more emotionally self-regulatory than people who are not self-efficacious. They can manage their stress in a more positive manner and use coping strategies that can solve their problems. These measures give efficacious individuals better health status. Hence, self-efficacy may be an important determinant of better psychological well-being after exposure to trauma.

This study, therefore, provides an understanding of the influence of self-efficacy on resilience and psychological stress of women living with HIV in Nigeria. Thus, Self-efficacy may boost

one's capability to better psychological adjustment and ameliorate the effect of psychological stress as posited by Bandura's cognitive theory of self-efficacy.

## Ethical Considerations

University of KwaZulu-Natal Biomedical Research Ethics Committee (BREC) approval was obtained for this study (BREC reference number: BE296/17). Approvals were also obtained from Niger state ministry of health and ethics committee of General hospitals Bida, Minna and Kontagora. Informed consents were obtained from all the participant and were assured that the data will only be used for research purpose before questionnaire administration.

## Conclusion

Self-efficacy is significantly associated with resilience and perceived stress. It is therefore recommended that measures to improve adherence self-efficacy are needed to improve the resilience and ameliorate the HIV-related stress of WLWH in Nigeria.

## Limitations

Some limitations should be considered in interpreting the findings of this study. First, as with cross-sectional designs, causal inference cannot be made from the findings. Secondly, the study was conducted in selected hospitals of only one state in Nigeria which may not allow for generalisation of

the findings to all women living with HIV in Nigeria. Finally, it should be noted that resilience and self-efficacy are dynamic processes as such measuring them once may not reflect the true pattern of their association with the disease process.

## Contributions of Authors

Aliyu Adamu was responsible for the conceptualisation of the study. Aliyu Adamu, Professor Joanne Racheal Naidoo and Professor Gugu Mchunu devised the plan for data collection and analysis. All authors critically reviewed and revised the manuscript. Aliyu Adamu prepared the final manuscript. All authors were involved in the final manuscript review and approval.

## Conflict of Interest

No conflict of interest declared.

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