

**FACTORS ASSOCIATED WITH ELEVATED ANXIETY SCORES  
AMONG CHILDREN AND ADOLESCENTS: A STUDY OF SELECTED  
CHILDREN'S HOMES IN KAJIADO COUNTY, KENYA**

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**ABSTRACT**

Child and adolescent anxiety disorders are the most prevalent forms of childhood psychopathology. Research on child and adolescent anxiety disorders has predominantly been done in westernized societies. Hence, there is a paucity of data on the prevalence, comorbidity, and predictors of anxiety disorders in children and adolescents in non-western societies including those in sub-Saharan Africa. This study examined the factors associated with elevated anxiety scores among children and adolescents in selected children's homes in Kajiado County. A quasi experimental study was conducted on 186 participants (aged 9-17 years). The anxiety symptoms of the participants were based on a BAI tool for assessment. Results of the BAI revealed that the mean score was 19.5 ( $\pm 12.1$ SD).

Logistic regression analysis was used to assess factors associated with elevated BAI Scores. Three predictors were significantly associated with elevated BAI scores, female gender, being on medication and the participants viewing themselves as failures. Since anxiety is associated with immense healthcare costs, it is imperative that this disorder is recognised in good time for appropriate and timely intervention.

**Keywords:** anxiety disorders, prevalent, predictors.

**INTRODUCTION AND BACKGROUND**

Fear and stress reactions are essential for human survival since the reactions enable people to pursue important goals and to respond appropriately to danger. In a healthy individual, the stress response (fight or flight) is provoked by a genuine threat or challenge and is used as a spur for appropriate action. An anxiety disorder, however, involves an excessive or inappropriate state of arousal characterized by feelings of apprehension, uncertainty, or fear (University of Maryland Medical Center, 2017).

According to Abbo et. al (2013), child and adolescent anxiety disorders are the most prevalent forms of childhood psychopathology. While research on child and adolescent anxiety disorders has predominantly been done in westernized societies, there is a paucity of data on the prevalence, comorbidity, and predictors of anxiety disorders in children and adolescents in non-western societies including those in sub-Saharan Africa. The above discussion gives credence to the prevalence of anxiety among children and adolescents.

There are many types of anxiety disorders which include, Generalized Anxiety Disorder (GAD), Panic disorder, Phobias, Obsessive-compulsive disorder (OCD), Post-traumatic stress disorder (PTSD), Separation anxiety disorder (which is almost always seen in children). GAD and panic disorder are the most common and are associated with immense health care costs as well as a high burden of disease. In this study, the researcher only assessed for generalized anxiety disorder (GAD) using BAI. GAD is persistent and excessive anxiety and worry about activities or events, even ordinary routine issues. This type of anxiety is characterised by a more-or-less constant state of worry and anxiety, which is out of proportion to the level of actual stress or threat in one's life. A diagnosis of GAD is confirmed if three or more of the following symptoms are present on most days for 6 months; being on edge or very restless, feeling tired, having difficulty with concentration, being irritable having muscle tension and experiencing disturbed sleep. These symptoms can cause significant distress and impair normal functioning (University of Maryland Medical Center, 2017).

Regarding causes of anxiety, the Mayo Clinic (2017) has identified a few factors that may increase the risk of developing an anxiety disorder. Children who may have endured abuse or trauma or witnessed traumatic events are at higher risk of developing an anxiety disorder at some point in life. Having a health condition or serious illness can cause significant worry about issues such as your treatment and the future. Additionally, a big event or a build-up of smaller stressful life situations may trigger excessive anxiety, a good example being a death in the family. In several studies, anxiety was associated with a lack of social connections and a sense of a more threatening environment. It also appears that more socially alienated populations have higher levels of anxiety.

## **METHODS**

The researcher used quasi-experimental design, a type of experimental design, the total number of children and adolescents screened in selected children's homes in Kajiado County was 506. Those identified to have anxiety after the screening were 186. Since the sampling frame was finite (close to the calculated sample size), every participant was sequentially recruited into the

study. Participants' enrolment was conducted concurrently in all selected homes for the whole study duration.

### **Sample Size**

In this study, the Lemeshow, Hosmer, Klar, and Lwanga's (1990) formula was used to calculate the minimum required sample size. The study used mean and standard deviation estimates by McCauley et al. (2015).

$$n = \frac{\delta^2 (Z_{\alpha/2} + Z_{1-\beta})^2}{(\mu_1 - \mu_2)^2}$$

n - Minimum required sample size

$\alpha$  - Type 1 Error (0.05)

$\beta$  - Type 2 Error (0.10)

$Z_{\alpha/2}$  - Standard normal deviate at 95% CI (1.96)

$Z_{1-\beta}$  - Standard normal deviate at 80% power CI (0.84)

Total number of children and adolescents was 152. However, in the course of recruitment, the number of participants was slightly over the sample by 17, bringing the number to 186 participants.

### **Demographic Questionnaire**

This socio-demographic questionnaire was generated by the researcher and included the following variables age, gender, class, religion, living with mother/father, step-parent, and grandparents) among other issues.

### **Beck Anxiety Inventory (BAI)**

The Beck Anxiety Inventory (BAI) was created by Aaron T. Beck, MD, and colleagues. It is a 21-item multiple-choice self-report inventory that measures the severity of an anxiety in adults and adolescents. Since the items in the BAI describe the emotional, physiological, and cognitive symptoms of anxiety but not depression, it can distinguish anxiety from depression. Although the age range for the measure is from 17 to 80, it has been used in peer-reviewed studies with younger adolescents aged 12 years and older. Each of the items on the BAI is a simple description of a symptom of anxiety in one of its four expressed aspects mainly subjective

("unable to relax"), neurophysiologic ("numbness or tingling"), autonomic ("feeling hot") or panic-related ("fear of losing control") (Grant, 2014). The instrument has excellent internal consistency ( $\alpha = .92$ ) and high test-retest reliability ( $r = .75$ ; Beck & Steer, 1990).

### **Methods of Data Analysis**

Analysis of factors associated with specific outcome variables (BAI) commenced by performing bivariate analysis. Mean  $\pm$ SD for specific outcome variables (BAI) across categories of each independent variable were compared using t-tests (two categories) or one-way ANOVA (three or more categories).

*Multiple Regression Analysis:* The results of the bivariate analyses informed multivariable statistical regression models for a more thorough exploration of outcome variables. Potential confounders and effect modifiers were tested using multiple linear regression models on continuous outcome variables (BAI). All independent variables with significant mean difference observed were considered together in a multiple linear regression. Beta coefficients with their corresponding standard error were tested by means of a t-test. Beta coefficients with corresponding 95% Confidence Interval (CI) were used to estimate the strength of association between independent and distinct dependent (Outcome) variables. Threshold for statistical significance for all analysis was set at  $p < 0.05$ .

## **RESULTS**

### **Demographic characteristics of the participants**

The demographic characteristics of the participants are shown in table 4.1. the sample was made up of 186 participants. A relatively high proportion of the participants (58.1%) was aged 13 – 17 years, with 57.5% being females. Regarding language of communication, majority of the participants (81.2%) used English as a primary language of communication with only 18.8% using Kiswahili. Analysis of religious affiliations revealed that most of the participants (54.8%) were protestants.

Variables	Total (n=186)	
	n	%
Age in years		
6 - 12 years	78	41.9%
13 - 17 years	108	58.1%
Gender		
Male	79	42.5%
Female	107	57.5%
Primary language of communication		
Kiswahili	35	18.8%
English	151	81.2%
Religion		
Roman Catholic	18	9.7%
Protestant	102	54.8%
Seventh Day Adventist	38	20.4%
Others	28	15.1%

**Levels of Anxiety of the Study Participants**

Table 4.4 presents mean, standard deviation and range of Beck Anxiety Inventory (BAI) scores. The mean Beck Anxiety Inventory (BAI) score was 19.5 ( $\pm 12.1$  SD) ranging between 0 and 54.

**Table 4.4: Levels of Anxiety**

Variables	n	Mean	SD	95% CI		Min.	Max.
				Lower	Upper		
BAI scores	186	19.5	12.1	17.7	21.2	0	54

Analysis of severity of Beck Anxiety Inventory (BAI) was done as presented in Table 4.5. Over half of the participants (59.7%) were either in moderate or severe state according to Beck Anxiety Inventory (BAI) scores suggesting that majority were in moderate and severe states. Only a small percentage, 14.5% had mild anxiety.

**Table 4.5: Severity of Beck Anxiety Inventory (BAI) Among the Participants**

Variables	Total (n=186)	
	n	%
Beck Anxiety Inventory (BAI) scores		
0-9 - Normal	48	25.8%
10-16 - Mild	27	14.5%
17-29 - Moderate	69	37.1%
30-63 - Severe	42	22.6%

Regarding factors associated with elevated BAI scores, Table 4.9 presents the different predictors. From the table, female gender had significantly high Beck Anxiety Inventory (BAI) score (22.0 ( $\pm 12.3$  SD)), compared to male (16.1 ( $\pm 11.1$  SD);  $p=0.001$ ). This result suggests that for the participants who were female they had a higher chance of having depression symptoms than those who were male.

Similarly, participants who agreed to the fact that many times they felt like failures had significantly high Beck Anxiety Inventory (BAI) score (22.2 ( $\pm 12.1$  SD)), compared to those who disagreed (17.2 ( $\pm 11.7$  SD);  $p=0.004$ ). Additionally, use of medication had significantly high Beck Anxiety Inventory (BAI) score (24.9 ( $\pm 11.3$  SD)), compared to non-use (18.5 ( $\pm 12.0$  SD);  $p=0.008$ ). This data suggests that for participants who viewed themselves as failures, and those who were on medication, their BAI scores were higher than those that were in this category.

**Table 4.9: Factors Associated with Elevated Beck Anxiety Inventory (BAI) Scores Among the Participants**

Variables	n	Mean	SD	95% CI		Min.	Max.
				Lower	Upper		
<b>Gender</b>							
Male	79	16.1	11.1	13.6	18.5	0	42
Female	107	22.0	12.3	19.7	24.4	0	54
p value		0.001					
<b>Many times I feel like a failure</b>							
Agree	86	22.2	12.1	19.6	24.8	0	54
Do not agree	100	17.2	11.7	14.8	19.5	0	46
p value		0.004					
<b>On medication</b>							
Yes	29	24.9	11.3	20.6	29.2	7	44
No	157	18.5	12.0	16.6	20.4	0	54
p value		0.008					

**Factors Associated with Elevated Beck Anxiety Inventory (BAI) Scores Among the Participants (Multiple Regression Analysis)**

Linear regression was used to model Beck Anxiety Inventory (BAI) scores using factors identified to be significant at  $P < 0.1$  during bivariate analysis. Backward conditional method was specified with removal at  $P < 0.05$ . Three independent predictors of elevated Beck Anxiety Inventory (BAI) scores among participants were identified as presented in Table 4.10.

Female gender ( $p = 0.001$ ), many times feeling that one is a failure ( $p = 0.009$ ), and being on medication ( $p = 0.031$ ) were significantly predictive of elevated Beck Anxiety Inventory (BAI) scores. These results suggest that, all the participants who were female had higher anxiety levels than those who were male. In addition, participants who many times felt like failures and those who were on medication had higher anxiety scores than those who did not feel as failures and those not on medication respectively.

**Table 4.10: Factors Associated with Elevated Beck Anxiety Inventory (BAI) Scores**

Variables	B	95% CI		t	p value
		Lower	Upper		
(Constant)	13.38	10.40	16.35	8.87	<0.001
Gender: Female	5.65	2.29	9.00	3.32	0.001
Many times I feel like a failure: Agree	4.49	1.14	7.84	2.65	0.009
On medication: Yes	5.07	0.46	9.68	2.17	0.031

### Key Findings

1. The overall mean BAI Scores was 19.5 ( $\pm 12.1$  SD) ranging between 0 and 54. This suggests that the average participants were within the moderate rating for anxiety. In other words, majority of the participants had moderate anxiety.
2. Three predictors were identified for anxiety, namely the female gender, being on medication and self-rating of being a failure. All the participants who fell in these three categories had higher levels of anxiety than those who did not.

## DISCUSSIONS

### Levels of Anxiety

The BAI score in this research was 19.5 ( $\pm 12.1$  SD) and with more females than males presenting with anxiety. BAI ratings of anxiety are mild, moderate and severe. Participants under this study fell within all the three ratings but the average score for the participants was moderate. According to Remes et al. (2014), anxiety disorders are the most common psychiatric illnesses. These conditions typically develop in adolescence and young adulthood and tend to run a chronic course. The same observation was made by Abbo et al. (2013) that child and adolescent anxiety disorders are the most common forms of childhood psychopathology, affecting about 10-20% of children and adolescents at some point in their lives.

According to Abbo et al. (2013), the prevalence of anxiety disorders was 26.6%, with rates higher in females (29.7%) than in males (23.1%). Merikangas et al. (2009) in their study similarly noted that the median prevalence rate of all anxiety disorders was 8% with a highly wide range of estimates of 2% to 24%. In addition, research by Christiansen (2015) showed that anxiety disorders are the most prevalent psychiatric disorders. This foregoing discussion evidently puts the prevalence rates of anxiety between 2% to just about 26.6%. The results of this study fell within these estimates implying that the study was consistent with other studies done elsewhere.

The logistic regression analysis revealed that the three independent predisposing factors were being female, medication and a self-rating of many times feeling that one is a failure.

### **Gender**

These results were comparable to a number of other studies where according to Abbo et al. (2013), predictors of anxiety disorders included female gender and living without parents. Data from prospective studies reveal a sharp increase in girls beginning as early as age 5, with a continuously increasing slope throughout adolescence. The rates of anxiety among males also tend to increase throughout childhood and adolescence but in a much slower rate compared to females. However, for the males, this increase begins to plateau in late adolescence. Consequently, females have notably higher levels of anxiety than males by age 6 (Merikangas et al., 2009). Correspondingly, research by Abbo et al. (2013) revealed that the prevalence of anxiety disorders was 26.6%, with rates higher in females (29.7%) than in males (23.1%). Further, according to Christiansen (2015), females are more likely than males to exhibit an anxiety disorder with lifelong and past-year rates of anxiety disorders being 1.5–2 times greater among females than males. According to the University of Maryland Medical Centre (2017), females have twice the risk for most anxiety disorders than males.

### **Medication**

In this study, medication was found to be positively associated with anxiety. Participants who were on medication had higher anxiety scores than those who were not on medication. This foregoing result was in congruence with research from the University of Maryland Medical Centre (2017) that though no causal relationships have been established, certain medical conditions have been associated with increased risk of panic disorders. Further, anxiety-like symptoms are seen in many other medical problems and many drugs have the possibility of producing anxiety symptoms or even precipitating anxiety reactions.

According to the Mental Health America (2017), anxiety disorders can coexist with physical health conditions as well. The same view was observed by the Mayo Clinic (2017) which noted that an unhealthy status or serious ailment can cause significant worry about issues such as treatment and the future. Moreover, for some people, anxiety may be associated to an underlying physical health issue.

Mental Health America (2017) posited that mental health and physical health are fundamentally linked. The observation was that people living with chronic physical health conditions experience depression and anxiety at twice the rate of the general population. Additionally, people living with chronic physical conditions often experience emotional stress and chronic

pain, which are related to the development of depression and anxiety. There is some proof that the more symptomatic the chronic physical condition, the more possibility that a person will also exhibit mental health problems (Canadian Mental Health Association, 2008). The results from this study are congruent with these findings. In this study, the participants who were on medication for diverse medical issues had higher anxiety scores than those who were not. This finding appears to suggest that being on medication was a predisposing factor to elevated BAI Scores.

### **Self-Rating on Positivity**

Regarding self-rating on positivity, children and adolescents who viewed themselves as failures had higher BAI Scores than those who viewed themselves as successful. This finding compared with research work by Law et al. (2012) who observed that positive behaviours constitute all the observable skills that increase the likelihood of success and personal satisfaction. This success and personal satisfaction is manifested in a number of areas; normative academic, work, social, recreational, community, and family settings. The authors continued to argue that such behaviours aim at improving an individual's quality of life to guarantee harmonious interaction between the individual and the environment. In adolescents, the focus can be on diverse aspects of their lives which include physical health, participation in healthy social activities and academic pursuit. Others are getting along with family members, following cultural norms, conforming to societal standards, and contemplating on transcendental values.

Significant changes in socio-cognitive skills, interpersonal negotiation skills, and regulatory mechanism occur during adolescence, thus fostering the development of positive behaviour. Besides, recognizing positive behaviour is an appropriate response of the social environment to such behaviour. The ultimate aim of recognition is to encourage children and adolescents to continue demonstrating positive behaviour (Law et al., 2012). This observation was congruent with the findings of this study which revealed that children and adolescents who viewed themselves as failures had higher BAI scores than those who did not. This underscores the importance of positivity among the children and adolescents in a bid to counter depression symptoms.

### **CONCLUSIONS**

In respect of the findings of this study, the levels of anxiety in the children's homes can be said to be high. Linear regression identified female gender, self-rating on positivity and being on medication as the independent predictors of elevated BAI Scores. The study established that the participants within these three characteristics had higher risks of being anxious more than those

who were not. These results were consistent with literature regarding the use of medication and female gender as well as a lack of positivity being a predictor for anxiety.

## REFERENCES

Abbo, C., Kinyanda, E., Kizza, R., Levin, J., Ndyabangi, S., & Stein, D. (2013). Prevalence, comorbidity and predictors of anxiety disorders in children and adolescents in rural north-eastern Uganda. *Child and Adolescent Psychiatry and Mental Health*, 7(1), 21-34. <http://dx.doi.org/10.1186/1753-2000-7-21>

Canadian Mental Health Association. (2008). *The relationship between mental health, mental illness and chronic physical conditions*. Retrieved from [http://ontario.cmha.ca/public\\_policy/the-relationship-between-mental-health-mental-illness-and-chronic-physical-conditions/#.WJGIUtJ97IV](http://ontario.cmha.ca/public_policy/the-relationship-between-mental-health-mental-illness-and-chronic-physical-conditions/#.WJGIUtJ97IV)

Christiansen, D. M. (2015). Examining sex and gender differences in anxiety disorders. In F. Durbano (Ed.), *A fresh look at anxiety disorders*. Chapter 2. InTech Open Access Publishers. doi: 10.5772/60662

Grant, M. (2014). *Beck anxiety inventory*. Retrieved from <http://www.coastalcognitive.com/>

Law, B., Siu, A., & Shek, D. (2012). Recognition for positive behaviour as a critical youth development construct: Conceptual bases and implications on youth service development. *The Scientific World Journal*, 2012, 1-7. <http://dx.doi.org/10.1100/2012/809578>

Mayo Clinic. (2017). *Anxiety*. Retrieved from <http://www.mayoclinic.org/diseases-conditions/anxiety/symptoms-causes/dxc-20168124>

McCauley, E., Gudmundsen, G., Schloredt, K., Martell, C., Rhew, I., Hubley, S., & Dimidjian, S. (2015). The adolescent behavioural activation program: Adapting behavioural activation as a treatment for depression in adolescence. *Journal of Clinical Child & Adolescent Psychology*, 45(3), 1-14. <http://dx.doi.org/10.1080/15374416.2014.979933>

Mental Health America. (2017). *Anxiety disorders*. Retrieved from <http://www.mentalhealthamerica.net/conditions/anxiety-disorders>

Merikangas, K. R., Nakamura, E. F., & Kessler, R. C. (2009). Epidemiology of mental disorders in children and adolescents. *Dialogues in Clinical Neuroscience*, 11(1), 7–20.

Remes, O., Brayne, C., & Lafortune, L. (2014). The prevalence of anxiety disorders across the life course: a systematic review of reviews. *The Lancet*, 384, 66. [http://dx.doi.org/10.1016/s0140-6736\(14\)62192-9](http://dx.doi.org/10.1016/s0140-6736(14)62192-9)

University of Maryland Medical Center. (2017). *Anxiety Disorders*. Retrieved from <http://umm.edu/health/medical/reports/articles/anxiety-disorders>