

## PSYCHOLOGICAL HEALTH OF INHABITANTS OF BLACK FLY INFESTED AREAS OF CAMEROON

**Harry Obi-Nwosu PhD**

Nnamdi Azikiwe University, Awka, Nigeria.

**Francis Arimoro PhD**

Federal University of Technology, Minna, Nigeria.

**Baleguel Nkot PhD,**

Yaounde Initiative Foundation, Cameroon.

**Nwafor Edwin PhD**

Nnamdi Azikiwe University, Awka, Nigeria.

### ABSTRACT

**M**ost environmental impact assessments do not take cognizance of psychological health of inhabitants of infested area. Yet changes in environments: physical, social and otherwise have been known to significantly affect health outcomes. This study, which assesses psychological health of Cameroonians residing in the blackfly infested area engaged a total of 196 participants, comprising of 108 females and 88 males. The inclusion criterion was; being literate, and having been living or/and working in the sampled area for a minimum period of ten years. It was hypothesized that 'Residents in the blackfly infested area would show significantly poorer psychological health than those not resident in this part of Cameroon.' Three theories: The Cognitive-Motivational Theory, Environmental Stress Theory and Frustration-Regression Hypothesis provide explanation for possible relationship between psychological ill-health and the environmental changes due to blackfly infestation and bites. Indeed, the activity of blackfly, which is a stressful stimulus may prelude the cogitative appraisal of the incidents as threatening, leading to the feeling of frustration, which can in turn inform or trigger psychological ill-health and reactive behaviours. Data was collected using the General Health Questionnaire, and the Independent t-test statistics was used to analyze the data since the study was a between-group design/study. Results revealed that residents in the blackfly infested area showed significantly poorer psychological health than those residents in non-infested area ( $t(1, 196) = 18.41, p \leq .00$ ) It was therefore recommended that strong psychological support should be provided for them to avoid severe breakdown.

**Keywords:** Blackfly Infestation, Psychological Health, Environmental Impact

## Introduction

Communities in the black fly infested area of Cameroun situated along the Sanaga River (the main resource for the hydroelectric power generation) have been experiencing severe health and socio-economic handicaps related to bites, onchocerciasis and related conditions, as well as side effects of prolonged use of Ivermectin. Unfortunately, many a time, psychological component of environmental impact assessment is downplayed in developing countries. However, the Yaounde Initiative Foundation (YIF) having been working with the Cameroonian Government and other stakeholders to reduce disease burden through vector control for many years, observed that besides medical and economic problems, behavioural issues are also becoming rather consequential. This observation necessitated the use of scientific methods to study possible psychological implications of the Blackfly infestation.

Black fly (sometimes called blandford fly, buffalo gnat, turkey gnat, or white socks) is any member of the family Simuliidae of the infraorder Culicomorpha. They are related to the Ceratopogonidae, Chironomidae, and Thaumaleidae. Over 1,800 species of black flies are known (of which 11 are extinct). Most species belong to the immense genus Simulium. Most black flies gain nourishment by feeding on the blood of mammals, including humans, although the males feed mainly on nectar. They are usually small, black or gray, with short legs, and antennae. They are a common nuisance for humans. They spread several diseases, including river blindness in Africa (Simulium damnosum and S. neavei) and the Americas (S. callidum and S. metallicum in Central America, S. ochraceum in Central and South America), capable of affecting or influencing the psychological/general health of those they bite.

Typically, the blackfly infested areas locate along the Sanaga River; a very important natural resource in Cameroon. The River stretches about 200 kilometers, with a width of up to 50 kilometers in some areas, and a rather high discharge rate of 5000 cubic meters per second. This characteristic of the River must have made it attractive for damming, and hydroelectric generation projects by the Cameroonian Government. This developmental activity further increased the discharge/flow rate of sections of the river, and geometrically increased the breeding potentials of the Black Fly, thus making the infestation ratio to rise to unprecedented 17,000 bites per person per day in communities like Edea, when spraying of insecticide is delayed.

Accordingly, the continuous rise in infestation ratio as shown has the capacity to impact or influence health in different ways. Health here connotes a condition of physical and psychological equanimity, as well as a measure of wellness – the level of fitness of the body measured in terms of level of adjustment in both internal and external environments. Health care in its broad sense relates to both physical and mental health, and encompasses the services and delivery related to the health and well-being of individuals and communities, including preventive, diagnostic, therapeutic, rehabilitative, maintenance, monitoring and counseling services (VandesBoss, 2007). It is from this holistic view that general health status (Psychological health), which is a measure or assessment of the level of an individual's wellness across the domains of: somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression become a critical measure of the level of wellness of an individual, as well as a predictor of how the individual may respond to environmental stimuli. Consequently, the uttermost interest of this paper is to assess the impact of blackfly infestation (and bites) on the general/psychological health: Anxiety and somatic symptoms, Social Dysfunction, and Depression of a section of Cameroonians.

Anxiety is a mood state characterized by apprehension and somatic symptoms of tension in which an individual anticipates impending danger, catastrophe, or misfortune. The future threat may be real or imaginary, internal or external; it may be an identifiable situation or a more vague one (Colman, 2003; VandesBos, 2007). Anxiety disturbance causes a significant degree of emotional distress, as well as impairment in such areas as academic, social and occupational functioning.

These effects are observable in somatic disorders also. Indeed, as partly observed above, much as anxiety may generate somatic discomfort, somatic discomfort may generate anxiety. Therefore, somatic complaints significantly affect cognitive functioning, social functioning, and adjustment to the environment. This assertion is in tandem with Ebigo (1981), and Uzoka, (1999), who contended that somatization represents a defense mechanism whereby psychological disorder is channeled into somatic complaints, thereby prevented from metamorphosing into the symptoms of full-fledged mental break down. Ebigo (1996) had explained that somatization is a non-verbal mode of expressing need for relief of emotional distress.

The other domain of social dysfunction is a well-established pointer to the presence of psychopathology (and substance abuse). A breakdown in interpersonal relations and incongruence between role behavior and role expectations in social settings is probably one of the first major worrisome signs of failing mental health. Agreeably, Uwaoma (2002) asserts that the ability to form and sustain constructive relationships is characteristic of good mental health.

Clinical depression is a serious ill – health condition that is much more than temporarily feeling sadness or blue. It involves disturbances in mood, thought, concentration, sleep, activity, appetite, and social behavior. It is frequently a life – long condition of which periods of well-being alternates with recurrence of ill-health. Swenson (2000), and Uwaoma (2007), hold that behaviours and symptoms of clinical depression such as negative thinking, withdrawal, reduction of pleasurable activities, inactivity, hopelessness, helplessness, and worthlessness are not just by-products, but actually serve to strengthen and prolong the depressive state. DSM-V holds that for major depressive disorder:

- A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure. Explicitly, this further includes:
  - (1) Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad, empty, hopeless) or observation made by others (e.g., appears tearful). (Note: In children and adolescents, can be irritable mood).
  - (2) Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation).
  - (3) Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. (Note: In children, consider failure to make expected weight gain).
  - (4) Insomnia or hypersomnia nearly every day.
  - (5) Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down).
  - (6) Fatigue or loss of energy nearly every day.
  - (7) Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick).
  - (8) Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others).
  - (9) Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.

- B. The symptoms cause clinically significant distress or impairment in social, occupational or other important areas of functioning.
- C. The episode is not attributable to the physiological effects of a substance or to another medical condition.  
Note: Criteria A-C represent a major depressive episode. Note: Responses to a significant loss (e.g., bereavement, financial ruin, losses from a natural disaster, a serious medical illness or disability) may include the feelings of intense sadness, rumination about the loss, insomnia, poor appetite, and weight loss noted in Criterion A, which may resemble a depressive episode. Although such symptoms may be understandable or considered appropriate to the loss, the presence of a major depressive episode in addition to the normal response to a significant loss should also be carefully considered. This decision inevitably requires the exercise of clinical judgment based on the individual's history and the cultural norms for the expression of distress in the contest of loss.
- D. The occurrence of the major depressive episode is not better explained by schizoaffective disorder, schizophrenia, schizophreniform disorder, delusional disorder, or other specified and unspecified schizophrenia spectrum and other psychotic disorders.
- E. There has never been a manic episode or a hypomanic episode. Note: This exclusion does not apply if all of the manic-like or hypomanic-like episodes are substance-induced or are attributable to the physiological effects of another medical condition.

The foregoing explanation is essentially to bring to perspective the major characteristics of the four domains used in the assessment of general health in this paper. It enables one to appreciate that 'ill-health' has severe adverse effects on thought patters of humans, so has significant implications for response/adjustment to both social and physical environment.

### **Socio-Economic and Health Implications of Blackfly Infestation:**

Blackfly bite is public health hazard and socio-economic problem of considerable magnitude in many riverine communities in West Africa (WHO, 1994; Adewale, Mafe, & Oyerinde, 1997). The insect transmits Onchocerciasis which is the world second leading cause of blindness (WHO, 1995). Onchocerciasis is responsible for an estimated annual burden of 388,576 disability adjusted life years (DALYs), 60% of which is accounted for by onchocercal skin diseases (OSD) (WHO, 2004). It is a disease of considerable socio-economic and public health importance.

Onchocerciasis has been implicated in cases of musculo-skeletal pain, epilepsy, inguinal hernias, secondary amenorrhea, spontaneous abortion, lactation difficulties, infertility and sterility (Okuliez, Elston, & Schwartz 2007). It also causes several symptoms, including unrelenting itching, physical scars from constant scratching, de-pigmentation and thickening of the skin, impaired vision, and complete blindness. About 99 % of onchocerciasis infected persons live in remote rural communities of Africa where about 75 million people are at risk of infection. The others live in Central and South America and Yemen in the Arabian Peninsula (Okuliez, Stibich, Sdirk, Elston, & Schwartz, 2004).

Apart from the disease transmission, the painful bites of the insect in many riverine areas are intolerable nuisance and could sometimes lead to blood loss and serve as portal for viruses, bacteria, protozoa and nematodes which the flies may carry on their bodies or exist in the environment (Ubachukwu, 2004; Usip, Opara, Ibanga & Atting, 2006). This could consequently culminate in low productivity, sickness and abandonment of the infested areas with significant implications on socio-economic well-being of the human population in such communities. Moreover, reports show that black fly bites have also accounted for reduced tourism, and deaths in wild and domestic animals in some endemic communities (Currie & Adler, 2008).

Again, important pioneering studies in the last decade, sponsored by the United Nations Development Programme (UNDP), the World Bank, and the World Health Organization (WHO) Special Programme for Research and Training in Tropical Diseases (TDR) have shown that onchocercal skin disease (OSD) is associated with a greater degree of morbidity than was hitherto appreciated. These studies demonstrated that severe OSD causes suffering to millions of people, particularly to those in the forest zone, where the blinding form of the disease is less prevalent (Amazigo 1993; WHO 1995b). OSD not only causes psychosocial problems, ostracism, and stigma (Brieger et al. 1998b; Okello, Ovuga, & Ogwal Okeng 1995; Ovuga et al. 1995) but also has a demonstrably negative socioeconomic impact on the productivity of farmers, breastfeeding, and school attendance (Amazigo 1994; Benton 1998; Kim et al. 1997; Oladepo et al. 1997; Vlassoff et al. 2000).

The relative contributions of both ocular and dermal symptoms to the burden of onchocercal disease and their socioeconomic consequences are substantial (Kale, 1998). The unbearable itching and blindness that accompany the disease hinder the ability of individuals to contribute to their own well-being, and they undermine the emotional and economic health of the household and the community. Consequently, onchocerciasis, which predominantly affects poor people in remote areas, can be directly linked to poverty. Furthermore, the activities of blackfly and its effects qualify blackfly bites as an environmental and physiological stressor capable of affecting the general health status of the victim. In this light, the health implication of blackfly infestation will be explained in terms of the link between stress (blackfly bites as the stressor) and psychological illness.

Literature abundantly expresses obvious connections between stress and many ill health conditions. Theories of the stress–illness link suggest that both acute and chronic stress can cause illness, and elaborate studies such as *Schneiderman, Ironson, & Siegel (2005) have buttressed this claim*. According to these theories, both kinds of stress can lead to changes in human, biological processes, and behavior. Regarding chronic stressors, which are stressors that persist over longer periods of time, this link is particularly true. This type of stressors tends to have a more negative impact on health because they are sustained and thus require the body's physiological response/adjustment over a period. This depletes the body's energy more quickly and usually exceeds the coping mechanisms, especially when the stressors cannot be avoided; hence its association with psychological disorders such as delusions (Kingston, & Schuurmans-Stekhoven, 2016), general anxiety disorder, depression, and post-traumatic stress disorder (Schlotz, Yim, Zoccola, Jansen & Schulz, 2011). These psychological states have been observed among those living in blackfly infested areas.

### **Theoretical Framework of the Study**

The present study builds on three related theories of cognitive-motivational, environmental stress and frustration regression hypothesis. Concisely, they explain the link and impact of physical experience of anguish and pain on human psychological health. These theories hold that one's appraisal of stress, through the combination of autonomic and cognitive factors underlie the individual's feeling of threat or frustration, which in turn often translate to maladjusted behaviours. Indeed, environmental stressors lead to a variety of reactions/responses/conditions, but the severity of psychological reaction depends on one's appraisal (especially if perceived as threatening). Such appraisal, which normally takes cognizance of skills and options available to the individual, generates feeling of frustration, helplessness, and loss of drive which preludes mental/psychological ill-health conditions. This is especially likely in the case of Cameroonians in the blackfly infested region, whose economy, social life and physical health have been devastated.

The Cognitive-Motivational-Relational theory proposed by US Psychologist Richard Lazarus (1922 – 2002).

This is an extension of the cognitive appraisal theory that puts equal emphasis on three processes involved in the generation of an emotion (a) appraisal (the cognitive process), (b) the central role of the individual's strivings, intentions, and goals (the motivational processed), and (c) the relevance of external events to these strivings (the relational process).

The second, the Environmental Stress Theory is the proposition that autonomic and cognitive factors combine to form an individual's appraisal of stressors, and that if perceived as threatening, would lead to stress reactions involving physiological, emotional, and behavioral elements that in turn elicit strategies designed to cope with and potentially adapt to the threat.

The third is the Frustration-Aggression Hypothesis proposed in 1941 by U.S Psychologists Robert Barker (1903-1990), Tamara Dembo (1902-1993), and Kurt Lewin. This is an assumption that frustration often leads to aggression – the behavior of hurting or harming someone. In this instance, frustration of goals and prospects of a good life occasioned by the blackfly infestations, and perceived neglect by authorities may engender such non-conformist behaviours as gangsterism, delinquency and crime; as means of survival, or may lead to complete psychotic breakdown.

### **Statement of the Problem**

Blackfly infestation is a major socio-economic and health problem in Cameroon. This has indeed attracted the attention of both researchers and Government. Although, a lot of studies have been conducted on blackflies, little has been done about the Psychological Health of Inhabitants of these areas. The present study seeks to bridge this gap in literature and provide advocacy data by assessing the psychological health of inhabitants of black fly infested areas of Cameroon. In line with this, the researchers sought to provide answer to the following question:

Would residents in blackfly infested area show significantly poorer psychological health than those not resident in this part of Cameroon?

### **Purpose of the Study**

The overall purpose of this study is to assess the psychological health of inhabitants of Black Fly infested areas of Cameroon.' Specifically, the study will find out: Whether residents in the blackfly infested area will show significantly poorer psychological health than people not resident in this part of Cameroon.

### **Hypothesis**

Residents in the blackfly infested area will show significantly poorer psychological health than those residents in non infested part of Cameroon.

### **Method**

#### **Participants**

A total of 196 persons comprising of 102 residents in the infested area of Cameroon and 94 non-residents in this part of Cameroon were selected to participate in the study that elicited responses on the psychological health of participants. It comprised 108 males and 88 females, aged between 25 and 68years, with a mean age of 37.69 and standard deviation of 6.80. Both residents in Edea region (infested area) and those inDuala (non infested area) were selected through convinoient sampling: a sampling technique whereby the researcher administers the questionnaire to samples who were readily available and willing to participate in the study. The inclusion criteria was being literate, and having been living and working in the area for a period of ten years.

### Instrument

One instrument was used in the study: The 12-Item General Health Questionnaire (GHQ-12) developed by Goldberg and Williams, (1988). This is a 12-item scale used to assess the severity of psychological distress experienced by an individual within the past few weeks using a 4-point Likert-type scale (from 0 to 3). The scale focuses on breaks in normal functioning rather than on life-long traits; therefore, it only covers disorders or patterns of adjustment associated with distress. Each item on the scale has four responses from “better than usual” to “much less than usual.” The item scores are used to generate a total score ranging from 0 to 36. The positive items are scored from 0 (*always*) to 3 (*never*) and the negative ones from 3 (*always*) to 0 (*never*). High summation scores indicate worse health.

Goldberg and Williams, (1988) reported Cronbach alpha coefficient for the GHQ, and it ranged from 0.82 to 0.86. Morakinjo (1979) found the sensitivity of GHQ to be 69.7%, specificity -96.0%, and overall misclassification rate of 10.7% using a cut-off of 12. However, the instrument is considered reliable and has been translated into 38 different languages. Lasebikan and Oyetunde (2012), and Okwaraji and Aguwa (2014) used the GHQ-12 in Nigerian studies; and Guruje and Obikoya (1990) had used the GHQ-12 as a screening tool in Primary Health Care System in Nigeria as well. Indeed, the GHQ is generally perceived by Clinicians as a very effective fast means of assessing mental health in the general population, and for research purposes. For this study, a Cronbach alpha of .86 was obtained.

### Procedure

The French translation of the GHQ12 was administered directly to adults in the areas chosen for the study that met the inclusion criteria, and were willing to participate. All the copies of the instrument distributed were returned, with the average completion time of 10minutes. Four copies considered as outliers were discarded, and the rest were collated and analyzed.

### Design and Statistic

This is a between subject design, that compared residents in two different locations on an independent variable. The independent t test statistic was used for analysis.

## Results

### Table I

Showing the Mean and Standard Deviation Scores

General Health Questionnaire-12

Residents of Cameroon	Mean	Std. D	N
Residents in Infested Area	17.7941	3.40453	102
Residents in Non-Infested Area	10.2447	2.13867	94
Total	14.1735	4.74158	196

The table above revealed that residents in infested area of Cameroon ( $M = 17.79$ , Std. = 3.40) scored higher in the psychological health assessment instrument than those resident in non-infested area of Cameroon ( $M = 10.24$ , Std. = 2.14).

**Table 2**

Showing summary of Independent t-test analysis on the differences between residents in the infested area of Cameroon and those residents in non-infested area of Cameroon on psychological health

Variable	f	Sig	t	df
Psychological Health				
Resident and Non-Residents	21.094	.000	18.409	171.804

The Independent t-test table showed that residents living in the infested area of Cameroon  $t(1, 196) = 18.41$ ,  $p \leq .00$  differed significantly from those resident in the non-infested area of Cameroon on psychological health. Thus, confirming the hypothesis which stated that 'Residents in the blackfly infested area would show significantly poorer psychological health than those not resident in this part of Cameroon.'

### Discussion and Conclusion

Result of this preliminary study on the psychological health of Cameroonians living in the black fly infested areas, suggests rather strongly that they have poorer psychological health than Cameroonians who leave close to them, but not within the infested area. The independent t-test analysis carried on was between people living in Duala region and those living along the Senaga region (from Edea).

The significant difference in psychological health could indeed be a direct manifestation of the damage to mental health caused by a combination of factors related to black fly infestation. For example, social life is hindered, most people stay indoors in the mornings and evenings to reduce/avoid "attack" by the insects, this includes school children (classes often start about 10am and dismiss about 2pm), farmers, and other workers must stay in during the more humid part of the day to maintain good health. It has also been observed that putting on certain colours of dresses attract the flies more than others. Thus people are prevented from putting on darker colours thereby restriction is placed on attire and colours: an obvious impediment to personal expression.

Another possibility is that the ivermectin treatment has psychological health implication. This has not been properly researched, however, there is no doubt that even the thought of taking such treatment could induce psychological reactions.

River blindness, varying levels of visual impairment, severe dermatosis and other medical conditions described as onchoceciasis which cause pain and disability undoubtedly provoke negative self-talks and negative beliefs about self and the environment. All these culminate in distress; especially when juxtaposed with the whopping 17, 000 bites per day for the average village, and may account for poorer mental health outcomes.

It may be argued that the result came out this way just because of economic differences between the two samples: people living in the infested areas are much more economically deprived than those in Duala region. It is an established fact that economic pressures precipitate psychological breakdown. This argument however may not strongly prevail against others earlier presented; after all, one of the major effects of infestation with black fly is devastation of economic activities.

Indeed the findings of this result could be said to have lend credence to the argument in support of the theoretical framework of this study: the stressor (blackfly) and its associated conditions – social and economic discomfit, and poor physical health, engender negative cognition/appraisal of life and all about it, and prelude frustration and other adverse psychological states. These adverse states are often interpreted as maladjustment behaviours, and are measured and identified here as poor psychological health.

It must be noted that poor psychological prelude poor and unfavourable interaction with the environment. It

is strongly believed and supported in literature that such conditions, especially among Africans (who are mainly external in locus of control orientation) could precipitate violence against perceived perpetrators of ill-treatment, and/or misplaced aggression.

### **Recommendations**

The government of the Republic of Cameroon, and her developmental partners should declare black fly control a national emergency. This will enable the allocation of meaningful funds and human resources required to deal with the menace. As a matter of urgency, full complements of medical and psychological health services should be provided for the affected communities, and infrastructure built to stimulate economic activities.

Further research should identify specific mental/psychological health challenges among residents in infected areas, as well as psychosocial deficits.

## References

1. Amazigo U. (1993). Onchocerciasis and Women's Reproductive Health: Indigenous and Biomedical Concepts. *Tropical Doctor*; 23(4):149–51.
2. Amazigo U. (1994). Detrimental Effects of Onchocerciasis on Marriage Age and Breastfeeding. *Tropical and Geographical Medicine* 46:322–25.
3. Benton B. (1998). Economic Impact of Onchocerciasis Control through the African Programme for Onchocerciasis Control: An Overview. *Annals of Tropical Medicine and Parasitology*; 92:S33–39.
4. Brieger William R., Frederick Oshiname O., Ososanya Oladele O. (1998b). Stigma Associated with Onchocercal Skin Disease among Those Affected Near the Ofiki and Oyan Rivers in Western Nigeria. *Social Science and Medicine*; 47(7):841–852.
5. Colman, A. M. (2003). *Oxford Dictionary Psychology*. New York. Oxford University Press.
6. Currie DC, Adler PH (2008). Global diversity of black flies (Diptera: Simuliidae) in fresh water. *Hydrobiologia*, 595(1): 469-475.
7. Ebigbo, P.O. (1981). Development of a culture specific Nigeria) screening scale of somatic Complaints indicating psychiatric disturbance culture. *Medicine and Psychiatry* 6: 55-69.
8. Ebigbo, P.O. (1996). Somatic Complaints of Nigerians. *Journal of Psychology in Africa, South of Sahara, the Carribean and Afro-Latin America* 1 (6): 28-45.
9. Ebigbo, P.O. (1996). Somatic Complaints of Nigerians. *Journal of Psychology in Africa, South of Sahara, the Carribean and Afro-Latin America* 1 (6): 28-45.
10. Kale O. O. (1998). Onchocerciasis: The Burden of Disease. *Annals of Tropical Medicine and Parasitology*; 92(Suppl. 1):S101–15.
11. Kim, A., A. Tandon, A. Hailu, H. Birrie, N. Berhe, A. Aga, G. & Mengistu, (1997). "Health and Labour Productivity: The Economic Impact of Onchocercal Skin Disease (OSD)." Policy Research Working Paper 1836, World Bank, Washington, DC.
12. Kingston, C. & Schuurmans-Stekhoven, J. (2016). Life hassles and delusional ideation: Scoping the potential role of cognitive and affective mediators, *Psychology and Psychotherapy: Theory, Research and Practice*
13. Ogden, J. (2007). *Health Psychology: a textbook* (4th ed.), pages 281–282 New York: McGraw-Hill ISBN 0335214711
14. Okello D. O., Ovuga E. B., Ogwal Okeng J. W. (1995). Dermatological Problems of Onchocerciasis in Nebbi District, Uganda. *East African Medical Journal*; 72:295–98
15. Okulicz, J. F., Elston, D. M. & Schwartz, R. A. (2007). Onchocerciasis (River Blindness). Available at <http://www.medicines.com> Date accessed: 15<sup>th</sup> September 2007.
16. Okulicz, J. F., Stibich, A. S., Sdirk, A., Elston, M. & Schwartz, R. A. (2004). Cutaneous onchocercoma. *International Journal of Dermatology*, 43: 170 – 172.
17. Oladepo O., Brieger W. R., Otusanya S., Kale O. O., Offiong S., Titiloye M. (1997). Farm Land Size and Onchocerciasis, Status of Peasant Farmers In South–Western Nigeria. *Tropical Medicine and International Health*; 2:334–40.
18. Ovuga E. B., Okelo D. O., Ogwal Okeng J. W., Orwortho N., Opoka F. O. (1995). Social and Psychological Aspects of Onchocercal Skin Disease in Nebbi District of Uganda. *East African Medical Journal*; 72:449–53.
19. Schlotz W, Yim IS, Zoccola PM, Jansen L, Schulz P (2011). The perceived stress reactivity scale: Measurement invariance, stability, and validity in three countries. *Psychol Assess.* (pp. 80–94).
20. *Schneiderman, N.; Ironson, G.; Siegel, S. D. (2005). "Stress and health: psychological, behavioral, and biological determinants". Annual Review of Clinical Psychology. 1: 607–628.*
21. Swenson, C.C. (2000). The long term reaction of young children to natural disasters. Presented at The Annual conference of American Psychological Association: San Fransisco.
22. Ubachukwu PO (2004). Human onchocerciasis: Epidemiological status of Uzo-Uwani Local Government Area of Enugu State, Nigeria. *Nig. J. Parasitol.*, 25: 93-99.

23. Usip LPE, Opara KN, Ibanga ES, Atting IA (2006). Longitudinal evaluation of repellent activity of *Ocimum gratissimum* (Labiatae) volatile oil against *Simulium damnosum*. *Mem. Inst. Oswaldo Cruz*, 101: 201-205.
24. Uwaoma, N. C. (2007). Personality, gender and age in depressed patient's response to Rational Emotive therapy and Assertiveness therapy. *Journal of contemporary psychology*, 1 (1) 26-38.
25. Uwaoma, N. C. (2007). Personality, gender and age in depressed patient's response to Rational Emotive therapy and Assertiveness therapy. *Journal of contemporary psychology*, 1 (1) 26-38.
26. Uzoka, A. F. (1999). Clinical Symptoms inventory. *African Journal of Psychiatry*. 2: 76-80.
27. VandesBos, G. R. (2007) (ed). *APA Dictionary of Psychology*. Washington D.C. American Psychological Association.
28. Vlassoff C., Weiss M., Ovuga E. B., Eneanya C., Nwel P. T., Babalola S. S., Awedoba A. K., Theophilus B., Cofie P., Shatabi P. (2000). Gender and the Stigma of Onchocercal Skin Disease in Africa. *Social Science and Medicine*; 50:1353–54.
29. WHO (1995b). *The Pan-African Study Group on Onchocercal Skin Disease. Report of a Multi-country Study*. Document TDR/AFR/RP/95.1. Geneva: WHO.
30. WHO (2004). Changing history. World Health Organization, World Health Report, 2004: 1 – 96.