Does Desert Seasonal Affective Disorder Exist? Environmental factors associated with anxiety, depression, and their comorbid symptoms among women in Northern Kenya.

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***Abstract*-This paper examines the symptoms of seasonal affective disorder (SAD), that exist in harsh and desert like conditions in Northern Kenya. These symptoms were identified and discussed during thematic, narrative group discussions that were conducted for a dissertation study with women living in Northern Kenya. The symptoms seemed to align well with those of SAD, which are characteristic of a recurrent major depressive disorder (MDD) with a seasonal pattern usually beginning in fall and continuing into winter months in countries in the Northern hemisphere that are further away from the equator. Previous research has shown that SAD causes depression in the spring or early summer, which the symptoms include sad mood and low energy. Those most at risk of this disorder are younger females, living far from the equator, and have family histories of depression, bipolar disorder, or SAD. During the narrative sessions, symptoms like SAD were noted during drought seasons. However, the criteria for diagnosis of those at risk of this disorder excludes the women or people living closer or at the equator.**

Keywords: **Seasonal Affective Disorder (SAD), women, Northern Kenya, comorbid anxiety, and depression.**

I. INTRODUCTION

Seasonal affective disorder (SAD) also indicated to as major depressive disorder (MDD), with a seasonal pattern. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5, 2013), SAD is the criteria for depression with a seasonal pattern that includes having depression that begins and ends during a specific season every year (with full remittance during other seasons), for at least two years and having more seasons of depression than seasons without depression over a lifetime (DSM-5, 2013). Mood changes are typically manifest when seasons begin and when they end. It is normal for people to experience changes in mood at numerous times of the year, however, with SAD, people begin to feel intense sadness, when days begin to get shorter in the fall and winter and begin to feel better in the spring with long daylight hours (Melrose, 2015).

Studies have shown that people with seasonal affective disorder have difficulty regulating the neurotransmitter serotonin, a neurotransmitter believed to be responsible for balancing mood (Mc Mahon, Andersen, Madsen, et al., 2014). They may also have difficulty with overproduction of melatonin (Lewy, Lefler, Emens, Bauer, 2006).

Melatonin is a hormone produced by the pineal gland that responds to darkness by causing sleepiness (Miller, 2005). As winter days become darker, melatonin production increases and, in response, those with SAD feel sleepy and lethargic. Other causes of SAD include desynchronization of the circadian rhythm (Wehr, Duncan, Sher et al., 2001) and vitamin D deficiency due to lack of adequate exposure to the sun during winter times (Anglin, Samaan, Walter, McDonald, 2013).

Similarly with patients with Major Depressive Disorders (MDD), it is important to diagnose suicidal thoughts may also present in patients with SAD, by using screening assessments for the same (Lam & Levitt, 1990; Praschak-Rieder et al., 1997).

Previous research has shown that SAD could be treated using various methods including Antidepressant medication, light therapy, improving deficiencies in Vitamin D and group Cognitive Behavioral Therapy- CBT (Melrose, 2015).

II. RATIONALE

Few studies have documented the role of environmental factors in relation to harsh climatic conditions in the risk of development of comorbid symptoms of anxiety and depression. However, environmental stressors associated with post-traumatic stress disorder (PTSD), have been linked to increased incidences of Major Depressive Disorders (Davidson, Tupler, Wilson, 1998). Further, another longitudinal study, found that women who experienced loss and danger subsequently developed both anxiety and depression (Brown, 1993). Although studies have documented sub-syndromal symptoms of Seasonal Affective Disorder (SAD), which occurs rarely during the hot summer season, few studies have documented similar symptoms that are exhibited during harsh drought seasons in Northern Kenya.

A previous study conducted with women in Northern Kenya indicated that, changing seasons associated with harsh climatic and arid conditions, precipitated by drought, were a risk factor for anxiety, depression, and their comorbid symptoms. These environmental changes were also associated with loss of lives of women and their children (Mwangi, 2018), which occurred due to drought that necessitated walking as far as 25 miles in search for water. In this endeavor, women and children lost their lives from attacks by elephants and other dangerous wildlife, which they share the scarce water resources (Mwangi & Mbwayo, 2020).

This paper documents findings of qualitative data derived from an experimental study that tested the effectiveness of psychoeducation treatment on anxiety and depression.

III. STUDY METHODS

For this study, a hundred and seven (107) female participants who met the criteria for minimal to moderate depressive and anxiety symptoms were recruited to participate in the experimental group (EG) and 101 women were recruited to participate in the control group (CG). Standardized tools, such as the Beck's Anxiety Inventory (BAI) and the Beck's Depression Inventory (BDI) were used to test for symptoms of anxiety and depression and the EUROHIS-8-item QoL Index was used to determine levels of Quality of Life (QoL) among respondents (Mwangi, 2017). The study adopted an eclectic model of psychoeducation (PE) to treat the symptoms of anxiety and depression and tests were conducted at baseline, midline and endline studies to measure its effectiveness in treating the identified symptoms and to establish its effect on levels of quality of life (QoL). The aggregate sample size for this study was 208 women.

Further, additional qualitative data was also collected and documented through Focus Group Discussions (FGDs). These narrative sessions allowed women to articulate their definition, understanding, attitudes, perspectives/perception and experiences of anxiety and depressive symptoms,which mood changes are serious and can affect how a person feels, thinks, and handles daily activities (Melrose, 2015).

Women experience seasonal affective disorder four times more often than men, with the age of onset estimated to be between 18 and 30 years and those living farthest from the equator in northern latitudes are most susceptible (Rosen, Targum, Terman, et al., 1990). In the United States, the prevalence of SAD was only 1.5% in Sarasota, Florida, but it was almost 10% in New Hampshire (Horowitz, 2008). In Canada about 2 to 6% of Canadians will experience SAD in their lifetime, and another 15% experience a milder form of SAD (Raymond & Levitt, 1999).

SAD is a disorder that could be caused by inadequate exposure to light among certain health professionals and others who work in shifts may be at specific risk (Morin, 1990). Further, SAD has high comorbidity with other disorders and may therefore be unreported or poorly diagnosed (Thompson, Thompson & Smith, 2004) Such disorders include bipolar, depressive, alcoholism, attention, deficiency, hyperactive disorder (ADHD), and eating disorders, which can make it difficult to diagnose (Lurie, Gawinski, Pierce & Rousseau (2006).

Although SAD occurs most frequently occurs in the Winter, it could also occur on rare occasions in summer (Melrose, 2015). The symptoms of SAD vary in severity for people who experience it in the winter these could include intense feelings of sadness, irritability, and may cry frequently; are tired and lethargic, difficulty concentrating, sleeping more than normal, low energy levels, decreased activity levels, social withdrawal, craving sugars and carbohydrates and tendency to gain weight because of overeating (Blaszczak, 2013).

Specific symptoms for summer-pattern SAD may include, trouble sleeping (insomnia), poor appetite, leading to weight loss, restlessness and agitation, anxiety, and episodes of violent behavior (Edwards, 2015; Oren, 2014). The symptoms of SAD can incapacitate the lives of those who experience the illness, and severely affect their ability to function. These symptoms can be as severe as those experienced by patients who are hospitalized with major depressive disorder (Dalgleish, Golden, Yiend, Dunn, 2010; Rosenthal, 2009).

Diagnosis of SAD can be done by using the Seasonal Pattern Assessment Questionnaire (SPAQ), which was developed 1984 by Rosenthal and his colleagues (Rosenthal, Bradt & Wehr, 1984). It is a reflective, self-administered tool that screens for the existence of SAD that is accessible and requires no training to administer (Melrose, 2015).

In these discussions, women also provided meaning and insights on whether depression and anxiety were perceived as a norm and how socio-cultural interventions to treatment of the same happened in their context. Further, the narrative sessions also interrogated the women's perspectives, perceptions, and definitions of QoL in their own socio-cultural contexts.

Prevalence, symptoms, and Effects of comorbid symptoms of anxiety and depression

Comorbid symptoms of anxiety and depression are prevalent among women living in Northern Kenya (Mwangi, 2017), which severely compromises their Quality of Life (Mwangi & Mbwayo,2020). While depression and anxiety are considered as two distinct and separate categories of disorders, they often occur in comorbidity (Kessler, Nelson, McGonagle, et.al, 1996; Sidik, Arroll, Goodyear-Smith, 2011). Further, even though depressive and anxiety disorders have idiosyncratic symptoms, they also share many common symptoms (APA, 2000). Patients who do not meet the diagnostic criteria for either a depressive or an anxiety disorder have a subsyndromal overlap of anxiety and depression symptoms (Pollack, 2005). Table 1 below shows comorbid depression and anxiety symptoms found present among women in Northern Kenya.

At baseline studies, the prevalence of comorbid symptoms of mild and moderate anxiety and depression was established at 23% for the CG and 12% for the EG and that of severe comorbid depression and anxiety was 12% for both the EG and the CG (Mwangi, 2017). The intervention implemented for the study was an eclectic model of psychoeducation, which was found to be effective in treating symptoms of mild and moderate and comorbid symptoms of anxiety and depression (Mwangi, 2017). Respondents with severe symptoms were referred to the Nanyuki treatment and referral hospital for pharmacological treatment. This finding indicates that psychoeducation can be adopted as a cost-effective treatment intervention of mild to moderate comorbid symptoms of depression and anxiety, in under privileged and resource poor populations.

Perceptions and attitudes on comorbid symptoms of depression and anxiety

Focus Group Discussions were conducted in both the experimental and control groups. These facilitated informal discussions that allowed the respondents to discuss freely how anxiety and depressive disorders were perceived and experienced in the communities. These narrative sessions also afforded women an opportunity to share freely their real-life experiences with anxiety and depression and also explored traditional and cultural approaches in prevention and treatment of anxiety and depressive symptoms.

During the narrative sessions women identified symptoms of anxiety and depression as common. Further, they noted that anxiety symptoms were locally known as *"Uraureushio"* and symptoms of depression were known as *"Aisinanu".* Their ability to identify and define and identify these symptoms was useful because it helped ease the narration of their experiences. According to respondents, people with anxiety symptoms were viewed as unsettled, restless constantly worried and avoided by others. They also indicated that if their symptoms escalated, they would be treated by administering a drink obtained from boiled indigenous cactus plant, locally known as *"Muneshoi."*

Table 1: Baseline Prevalence of Anxiety & Depression in EG and CG (Source Mwangi, 2017)

	Baseline					Baseline			
	N=107		N=101			N=107		N=101	
	EG		CG			EG		CG	
	n	%	n	%		n	%	n	%
Prevalence Mild Anxiety	21	19.6	42	41.6	Prevalence Mild Depression	24	22.4	21	20.8
Prevalence Moderate Anxiety	85	79.4	56	55.4	Prevalence Moderate Depression	15	14.0	27	26.7
Prevalence of severe anxiety	0	0	0	0	Prevalence of Severe Depression	0	0	0	0

This cactus plant is known locally for its medicinal properties and the women alluded that it helped to calm people who exhibited symptoms of anxiety and depression. This finding is critical and corroborates with findings of other studies that have noted the need to facilitate and strengthen community-based processes, which would help tap onto personal and communal strengths and resources for the possibilities of prevention and treatment of anxiety, depression and their comorbid (Lawson et al., 2009; Mwangi & Mbwayo, 2020).

On the other hand, the respondents noted that depression symptoms were common and evident when people experienced loss and when tragic events happen such as loss of lives from attacks by elephants/ other wildlife, domestic violence and drought which resulted in food and water insecurity. This finding corroborates those of other studies which showed that environmental factors including traumatic events and loss are risk factors for anxiety and depression (Davidson, Tupler, Wilson, 1998; Brown, 1993).

The women reported that due to their social nature, they were quick to identify when one of them was exhibiting signs of depression and they visited with them in turns and encouraged them to talk and share their difficult moments and situations. They also supported them by providing them with kind words and actions. On the other hand, the women noted that due to cultural and gender expectations, men did not talk much about their experiences. They also internalized their depressive and anxiety symptoms making it difficult to know when they were experiencing mood changes. Further, they acknowledged that depressive and anxiety symptoms became evident in men, through externalized actions such as excessive drinking, domestic violence, and evidence of other socially unacceptable behavior.

During the psychoeducation treatment sessions, women said that they were not aware that some of the symptoms of anxiety and depression that they were taught, were associated with serious mental illness, which required proper diagnosis and treatment or intervention by a medical doctor, usually a psychiatrist, or a trained psychologist for psychotherapy.

The link between changing seasonal patterns and the risk for developing depressive and anxiety symptoms.

Environmental factors associated with life events have been associated with anxiety and depressive disorders (Davidson, Tupler, Wilson, 1998). Further changes in seasons that occur in the Northern hemisphere may contribute to depressive symptoms seasonal affective disorder (DSM-5, 2013).

However, few studies have documented anxiety and major depressive symptoms which result from changes in seasons of hot arid conditions such as those in Northern Kenya. Further, the women noted that life events such as the grief and trauma that arises due to the loss of lives are related to seasonal and unique environmental factors that result in drought conditions.

In the narrative FGD sessions, women said that the symptoms of anxiety and depression exacerbated during drought season, when food and water were scarce, similar to those in the Northern hemisphere may contribute to depressive symptoms seasonal affective disorder (DSM-5, 2013).

However, few studies have documented anxiety and major depressive symptoms which result from changes in seasons of hot arid conditions such as those in Northern Kenya. Further, the women noted that life events such as the grief and trauma due to the loss of lives are related to seasonal and unique environmental factors that result in drought conditions.

In the narrative FGD sessions, women said that the symptoms of anxiety and depression exacerbated during drought season, when food and water were scarce.

This is because women and children had to walk as far as 25 kilometers in search for water and this puts them at risk of attacks from elephants and other wild animals with which people share this scarce resource.

According to the women's narratives, women and children have lost their lives in these attacks which occur during the drought season (Mwangi & Mbwayo, 2020). In addition to this, they noted that anxiety and depressive symptoms also increased in anticipation of drought season. This anticipation resulted in symptoms synonymous to panic disorder. Further anticipated spousal domestic violence that was associated with delays in conducting domestic chores such as cooking were indicated to be a source of anxiety, depression, and their comorbid symptoms (Mwangi, 2018).

Further, some older women also identified sociocultural factors such as polygamy (having co-wives) and many children as protective factors, which mitigated the development of anxiety and depression symptoms that result from drought conditions precipitated by adverse environmental or seasonal factors in Northern Kenya (Mwangi, 2018).

IV. CONCLUSION

The study established that environmental factors associated with changing seasons resulting from harsh drought conditions are risk factors for developing anxiety and depressive symptoms among women living in Northern Kenya. It also acknowledged that Psychoeducation could be adopted as a cost-effective method for prevention or treatment of anxiety, depression, and their comorbid symptoms. The study also established that there exists resources in the community that are used to treat anxiety and depressive symptoms. These include a type of cactus plant known as *"Muneshoi"* that is boiled, and the drink administered to calm people who exhibit anxiety, depressive and their comorbid symptoms. Further, the study established that changing seasons from wet/rainy seasons to drought season are a risk factor for developing anxiety, depression, and their comorbid symptoms. This finding could have an implication on the diagnosis criteria for Seasonal Affective Disorder (SAD) in tropical countries and could necessitate consideration of differential diagnosis for the Diagnostic & Statistical Manual for Mental Health Disorder (DSM-5, 2013).

V. RECOMMENDATIONS FOR FURTHE RESEARCH

This paper recommends the need to further investigate anxiety, depressive and their comorbid symptoms related to changing seasonal patterns resulting from drought conditions in Northern Kenya. This investigation could include neurodiversity changes in the brain's chemical activity that may occur from changes in seasonal patterns. The findings could be compared to chemical changes in the brain that have been evidenced in individuals in the Northern Hemisphere which exhibit subsyndromal SAD symptoms during the summer season. There is also need for further investigation to establish the neurotransmitter effects of the cactus plant *"Muneshoi"* in alleviating anxiety and depressive symptoms. Future research could also explore whether the "*Muneshoi"* cactus plant is only uniquely available in Northern Kenya or whether it is found in other global regions.

An additional recommendation is the need for further research that could incorporate assessment tools that would help to diagnose SAD among women in Northern Kenya that are specific to their needs. Such tools would facilitate proper diagnosis of SAD and additionally help to tailor make treatment interventions suitable for SAD indicated by harsh arid seasonal patterns associated with drought in regions closer to the equator.

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