Distress and "problematic pregnancies" : prevalence and factors associated with depressive morbidity in women visiting perinatal primary health care settings of Dar es Salaam, Tanzania

Distress and “Problematic Pregnancies”

Prevalence and Factors Associated with Depressive Morbidity in Women ~~visiting~~ Perinatal Primary Health Care Settings of Dar es Salaam, Tanzania

Sylvia Florence Kaaya

ISBN 978 90 5278 921 7

Prevalence and Factors Associated with Depressive Morbidity in Women ~~visiting~~ Perinatal Primary Health Care Settings of Dar es Salaam, Tanzania / Sylvia Florence Kaaya
- Maastricht University, thesis—With references -
With summary in English and Dutch

Design and Printing: Datawyse / Universitaire Pers Maastricht

Distress and "Problematic Pregnancies"

Prevalence and Factors Associated with Depressive Morbidity in Women ~~visiting~~ Perinatal Primary Health Care Settings of Dar es Salaam, Tanzania

Dissertation

to obtain the degree of Doctor at the Maastricht University,
on the authority of the Rector Magnificus, Prof. dr. G.P.M.F. Mols
in accordance with the decision of the Board of Deans,
to be defended in public on Friday 26 February 2010, at 10.00 hours

by

Sylvia Florence Kaaya

UNIVERSITAIRE PERS MAASTRICHT

Supervisors

Prof. dr. H. W. van den Borne
Prof. dr. G.J. Kok

Co-supervisor

Prof. dr. G. P. Kilonzo MD. (Muhimbili University of Health and Allied Sciences)

Assessment Committee

Prof. dr. N. de Vries (chairman)
Prof. dr. L. M. G. Curfs
Prof. dr. C. M. H. Hosman
Prof. dr. P.S. Reddy (MRC, South Africa)
Dr. R. Ruiter

The studies presented in this thesis were performed within the School of Public Health and Primary Care (CAPHRI) which participates in the research school CARE, Netherlands School of Primary Care Research, accredited by the Royal Netherlands Academy of Arts and Sciences.

The printing of this thesis is financially supported by the Lundy Foundation and the Parmena Trust Fund

Dedication

To my mentor; for sharing his passion, commitment, positive outlook and persistence when encouraging a cultural contextualization of mental health concerns and needs of perinatal women in Tanzania. My only regret is Prof. dr. Herman Schaalma is gone before the ultimate completion of this thesis. He will however not be forgotten, continually remembered in this and his other contributions to better understandings of the health status of persons in low income contexts. Thank you for your guidance, time and collaborative friendship *kaka*.

Acknowledgement

To my supervisors Professors Bart van Den Borne and Gerjo Kok and the Late Herman Schaalma for their prompt guidance, critical reviews and feedback; my mentor Professor Kilonzo who tirelessly listened and provided valuable comments; and my colleagues, Drs. Jessie Mbwambo and Mary-Kay Smith-Fawzi who were always there during various stages of the research processes. Support from institutions including Muhimbili University of Health and Allied Sciences (MUHAS), and the Harvard School of Public Health through the MUHAS- Harvard collaboration led by Prof. Wafaie Fawzi was invaluable. I am also indebted to my co-authors, in the various articles that form the basis of this thesis. The list is not complete without mentioning community members and patients that participated in the various studies, and my clinical colleagues Drs. Kissah Mwambene, Ayoub Maghimba and many others in the Department of Psychiatry and Mental Health at the Muhimbili National Hospital who without complaint, providing necessary clinical care cover that enabled time for completion of this thesis. Thank you.

Finally I am particularly indebted to the patience and support of my husband Ephata, my children Diana and Mark and other family members. *Asanteni*

Contents

Chapter One

Introduction

ABSTRACT

Tanzania like many developing countries is challenged by an epidemiological transition characterized by increasing prevalence of non-communicable diseases, including mental disorders in a background of high rates of communicable diseases. In a context with paucity of mental health care resources neuropsychiatric morbidity is a significant challenge to health care services and providers. In particular mental disorders commonly encountered in primary care, the most common of which is depressive disorder. Women, compared to men across cultures and development contexts are more vulnerable to depressive disorders, particularly during the perinatal period. Women's greater vulnerability to depressive disorders becomes apparent during adolescence and increases during the child-bearing years before declining in old age. Experiences and expressions of depressive moods are greatly influenced by culture both through meanings cultural ways of understanding ascribe to emotional experiences and cultural influences on forms of emotional expression including what is appropriate to express, when and how. Cultural variations on particularly the expression of depressive mood and related symptoms pose significant challenges to assessment and recognition of morbidity. Women in developing country contexts, such as is Tanzania, face many health challenges during the child bearing period. However, very little research attention has been focused on the mental health status of pregnant and postnatal women in Tanzania. This thesis hopes to redress this short fall by informing development of strategies that aim to strengthen comprehensive reproductive health care services in the population sub-group of perinatal women.

BACKGROUND AND MENTAL HEALTH CARE RESOURCES IN TANZANIA

Tanzania has a total population of about 38.3 million, including those residing on the islands of Pemba, Unguja and Mafia (UNAIDS 2006). Kiswahili a national language, spoken by nearly the whole population, unites about 126 different linguistic groups. The largest ethnic group is Bantu with smaller proportions of Nilotic and Cushitic groups, and an immigrant Indian and Arab population. With an estimated per capita gross domestic product of 744 USD, the country is classified amongst the poorest in the world. Health literacy remains low in a context of an adult literacy rate estimated at 69.4%; with a 50% combined primary, secondary and tertiary education gross enrolment ratio. Life expectancy at birth was estimated at 51.0 years in 2007 (United Nations Development Programme, 2007). While infectious disease and poor nutritional conditions are common, much less is known about the national prevalence of mental disorders. This situation is not typical for Tanzania, but holds true for many countries in the region (Gureje *et al*., 2006a; Swartz *et al*, 2005).

The absence of systematic information on the epidemiology of mental disorders may reflect the paucity of human and others resources for mental health care. Furthermore, resources for the prioritization of mental health care is challenged by competition for resources from a limited pool with highly prevalent and life threatening infectious and communicable diseases. In 1980, the National Mental Health Programme (NMHP) was launched as a vertical programme to spearhead development of mental health services. With an absence at the outset of facilities for training mental health care providers, the programme's progress has been very gradual. Tables 1a and b summarize changes in the quantity of mental health care resources in Tanzania from the inception of the NMHP. By 2005, compared to 1981 despite a more than 1,000 times increase in the national number of mental health care beds, rates remained low at 1.4 beds per 10,000 persons across different health care delivery levels (Table 1a) (World Health Organization, 2005).

Table 1a: Mental health care infrastructure in 2005 compared to 1981

Total psychiatry beds and per type of facility	per 10,000 population	
	1981[1]	2005[2]
Total psychiatric beds	0.00	0.70
Psychiatric beds in mental hospitals	0.00	0.36
Psychiatric beds in general hospitals	0.00	0.04
Psychiatric beds in other settings	0.00	0.30

Key: [1]Schulsinger & Jablensky, 1991; [2]Mental Health Atlas—2005: Country Profile Tanzania (World Health Organization, 2005)

Table 1b: Mental health care human resource in 2005 compared to 1981

Human resource in Mental Health Care	per 100,000 population	
	1981 [2]	2005 [3]
Number of psychiatrists	–	0.04
Number of Assistant Medical Officers (Psychiatry)	–	0.04
Number of neurosurgeons	–	0.01
Number of psychiatry nurses	–	2.00
Number of neurologists	–	0.05
Number of psychologists working in clinical settings	–	0.01
Number of social workers	–	0.20

Key: [1]Schulsinger & Jablensky, 1991; [2]Available information suggested only two psychiatrists and 40 psychiatry nurses in the whole country (Ministry of Health and Social Welfare, 2006); [3]Mental Health Atlas-2005: Country Profile Tanzania (World Health Organization, 2005)

Human resource for mental health care increased from four psychiatrists in the country to an estimated 0.04 psychiatrists per 100,000 populations from 1981 to 2005; and a total of 40 psychiatry nurses to an estimated 2 per 100,000 populations

in the same time frame. Similar increases in numbers of social workers, psychologists, neurologists and neurosurgeons were also reported though at a lower rate (Table 1b) (World Health Organization, 2005). Limited mental health care resources pose significant challenges to service coverage, and hence recognition of disorders, and planning for expansion of services. To increase access to mental health services at primary levels of care, the NMHP draws heavily on the recommendations of the World Health Organization (WHO) Expert Committee on Mental Health that advocated for transfer of basic mental health care, knowledge and skills to primary health care providers (World Health Organization, 1975). Decentralization of mental health care in Tanzania is guided by a National Policy Guideline for integration of mental health in primary health care (Ministry of Health and Social Welfare, 2006). The policy guideline defines specific tasks and standards for mental health care inputs at various levels of the health care delivery system. Tertiary care levels with the largest allocation of mental health care professionals, being charged with pre and in-service training as well as quality monitoring responsibilities. Common mental disorders, such as depression and anxiety, are defined as target conditions for diagnosis and management at primary health care levels. Information on the epidemiology of depression at primary care levels would increase impetus for early recognition and interventions.

GLOBAL BURDEN OF NEUROPSYCHIATRIC/BRAIN DISORDERS

It is estimated that 450 million people world-wide suffer neuropsychiatric conditions that include unipolar depressive disorders, bipolar affective disorder, schizophrenia, epilepsy, alcohol and selected drug use disorders (World Health Organization, 2001). Recent quantification of “burden of disease” makes mental health care needs more explicit by adding a disability component to traditional mortality and morbidity measures. Burden of disease quantifications measure the impact of premature death and disability (using disability weights) combined in a single measure of disability adjusted life years (DALYs). DALYs express the years of life lost due to premature death and years lived with disability (YLDs) of a specified severity and duration. These more sensitive quantifications of disease burden better accommodate chronic and disabling mental health conditions than measures of incidence, prevalence and mortality.

The Global Burden of Disease Report showed that 10.7% of the world’s total YLDs were attributable to depression (Murray & Lopez, 1996). Depression was the fourth leading cause of total burden of disease accounting for 3.7% of total DALYs. Updated burden of disease estimates that utilized new epidemiological data, showed depressive disorders accounting for 12.1% of the total YLDs globally and 4.46% of total DALY’s (Ustun at al., 2004). Perinatal conditions, lower respiratory infec-

tions, HIV and AIDS and unipolar depressive disorders were the four leading causes of DALYs in men and women combined. Differences in epidemiological patterns in rich and poor localities of the world were evident with higher total DALYs attributable to depression (8.9%) in high-income compared to low and middle income countries (4.1%). This likely reflected the higher share of disease burden from communicable, perinatal and nutritional disorders in the latter, ranging from 70-75% compared to only 5% in higher income countries. Due to a paucity of research information on the magnitude of depression in sub-Saharan Africa, it is likely the contribution of depressive morbidity to the burden of disease, may be under-estimated. Epidemiological evidences used to compute disease burden, attributable to mental disorders have typically relied on prevalence data from only three countries in a culturally diverse region (Ustun *et al*., 2004). Furthermore, as observed by Desjarlais *et al*. (1995), estimates of disease burden do not take into account known neurological and psychiatry sequel of poverty, related nutritional disorders, violence and other adverse environmental exposures, that tend to be much more prevalent in the low income developing countries of the SSA region.

The global burden of disease attributable to depression varies by sex with overall DALYs in women being 5.6% (fourth leading cause of BOD in women) and in men 3.4% (seventh leading cause of BOD in men) (Ustun *et al*., 2004). Empirical evidences from multicentre prevalence studies show across diverse communities and social contexts, a consistently greater prevalence of depression, anxiety and psychological distress in women compared to men. In a community-based multicentre study, for example, absolute life time rates of depression varied from 1.5 to 19% across centres, with female-to-male ratios ranging from 1.6 to 3.1 (Weissman *et al*., 1996). Similarly, in a primary care based multicenter study in 14 sites worldwide, Maier *et al*. (1999) showed a two-fold higher vulnerability to depression in women and a lack of contribution of cultural context to the observed female preponderance in prevalence.

Although there is a remarkable paucity of epidemiological studies of psychiatry disorders in general in SSA (Gureje *et al*., 2006(a)), some data suggests the prevalence of depression may be higher than observed in more developed countries (Swartz, 1998). Information from fifteen studies providing depression morbidity data from nine SSA countries are summarized in Table 2. Generally prevalence rates for depression were highly variable ranging from as low as 2.3% and 5.9% (Kebede & Alem, 1999) to as high as 30% (Abas *et al*., 1997). These variations remained evident when rates derived from studies utilizing diagnostic tools for measurement of depressive morbidity were considered; hence one month depression prevalence rates from community-based samples for women ranged from 5.9% to 14.5%; while for men the range was from 2.3% to 8.8% (Kebede & Alem, 1999; Hollifield *et al*., 1990).

Table 2: Selected Epidemiological Studies Assessing Prevalence of Depression in Sub-Saharan African Populations

Study	Place	N (%response)	Disorder	Measures	Depression Prevalence Findings
Findings from Community -based Samples					
Orley & Wing, 1979.	Uganda: Rural	206 (95.8%)	Major Depression	PSE and SPI	Women 22.6%; men 14.3%
Hollifield, et al., 1990.	Lesotho: Rural	356 (78%)	Major Depression; One month prevalence	DIS	Women 14.5%; men 8.8%
Rumble, S, et al., 1996	South Africa: Rural	481 (85.8%)	Major Depression and depressive neurosis: Weighted prevalence	SRQ and PSE	Overall 18%; no sex differences
Bhagwanjee, et al., 1998.	South Africa: Rural	354 (100%)	Major Depression and Dysthymia or both conditions: Weighted prevalence	SRQ-20 & Clinical Interview	Overall 12.1% Major depression in women: 16.9%; men 6.3%; variation significant Dysthymia in women: 13.3%; men 26.1%; variation significant
Kebede & Alem, 1999.	Ethiopia: Urban	1,420 (70%)	Affective disorders: One month prevalence	CIDI	Women: 5.9%; men 2.3%
Bolton, et al., 2002	Rwanda: Rural	380 (95%)	Major Depression; One week prevalence	HSCL	Women: 17.7%; men: 11.2%; variation not significant
Ovuga, et al., 2005	Uganda: Rural Adjumani & Bugiri	Adjumani: 524 (91.7%) Bugiri: 415 (97%)	Major Depression: Point prevalence	BDI	Adjumani participants (exposed to armed insurgencies) showed seven times higher likelihood of significant depressed mood than Bugiri participants (less exposed to armed conflict). Women were twice more likely to be depressed in both sites
Gureje, et al., 2006b	Nigeria: Mixed urban to rural	4,984 (79.9%)	Any mood disorder; Life time and 12-month prevalence	WMH-CIDI	Overall life time: 4.1% Overall 12 month prevalence: 1.3% No sex differences
Gureje, et al., 2007.	Nigeria: Mixed urban to rural	2,152 (74%): Older persons 65 years and above	Major Depression: Lifetime and 12 months prevalence	WMH-CIDI	Life- time: 26.2%; 12 months:7.1% Disorder 1.9 times more likely in women

Study	Place	N (%response)	Disorder	Measures	Depression Prevalence Findings
Findings from Primary Care Populations					
Gureje, et al., 1992.	Nigeria: Urban	787	Major Depression	CIDI	Major depression three times higher in women
Hollifield et al., 1994	Lesotho:	126 (77%)	Major Depression; One month prevalence	DIS	Overall 23%
Abas, et al., 1997.	Zimbabwe: Urban	172 (95%)	Major Depression: One year prevalence	SSMD & PSE	Women: 30%
Patel, et al., 1997.	Zimbabwe: Urban	199 cases; 197 controls	Common Mental Disorders	Shona Symptom Questionnaire	Women 1.5 times more likely to experience CMD
Sokoya, et al., 2003	Nigeria: Urban	202 (95%): Older persons 65 years and above	Major Depression: Point prevalence	GDS & GMS, Yoruba version	Overall: 7.4%; no sex difference
Findings from Primary Care HIV Positive Populations					
Monahan, et al., 2008	Kenya: Urban	347 (87%)	Major Depression; other Depressive disorder: Point prevalence	PHQ -9	Overall 13% Major Depression; 21% Other Depression; no sex differences; significantly higher severity scores in women.

Key: BDI =Beck Depression Inventory; CIDI =Composite International Diagnostic Interview; DIS =Diagnostic Interview Schedule; GDS =Geriatric Depression Assessment Scales; GMS=Geriatric Mental State and AGECAT; HSCL =Hopkins Symptom Checklist; PHQ-9 =Patient Health Questionnaire-9; PSE=Present State Examination; SPI=Standardized Psychiatric Interview; SRQ=Self Report Questionnaire; SSMD=Shona Screen for Mental Disorders; WMH-CIDI =World Mental Health Survey version of the Composite International Diagnostic Interview

Sex differences in prevalence of depression vary by age, appearing during adolescence, stabilizing in adulthood and declining in old age (Jorm, 2000). While prevalence rates of depression may increase equally in women and men after adolescence, the increase in women during adulthood occurs at a time in the human lifecycle associated with childbearing. Most (n=9) of the 13 studies summarized in table 2 that showed sex differences in the prevalence of depression, indicate rates about two to three times higher in women. While Monahan *et al*. (2008) did not find sex differences in rates of depression in a Kenyan population of HIV positive persons, women scored significantly higher on symptom severity. In Nigeria, Gureje *et al*., (2006b) did not find sex differentials in depression rates in a mixed rural, periurban and urban community-based sample, and Sokoyo *et al*., (2003) similarly, did not find sex differences in rates of depression in a primary care population of elderly persons. Finally, Rumble *et al*. (1996) showed, in a South African community-based sample, lack of sex differentials in rates of when assessing the combined rate of major and minor depressive disorders.

While the wide variations in rates of depression reported in SSA could be explained by instrumentation differences in the assessment of depression or variations in the types of depressive disorders studied, the wide cultural diversity in the region could influence evaluation of what is perceived to be distressing, the experience of depressive affects, it's interpretation, and the manner in which distress is expressed (Lutz, 1985). Such cultural influences on the experience and expression of emotional worlds may pose significant challenges to the assessment of depressive morbidity (Patel, 2006).

The child-bearing period in Tanzanian women is the target of this thesis, and the reported studies sample perinatal women for a number of reasons. Firstly, an assumption is made that women's higher vulnerability to depressive disorders may also apply in the Dar es Salaam context; an urban setting characterized by high rates of rural to urban migration and attendant urban poverty. Secondly, in addition to poverty related stressors, the Dar es Salaam region ranks second to the Iringa (prevalence 16.8%) region in prevalence of HIV, with rates at 10.2% in persons aged 15-19 years. These rates are higher than the national prevalence rate of 5.7%; nationally rates are highest at 10.4% in women aged between 30-34 years who are at the peak of child bearing (Tanzania Commission for AIDS (TACAIDS), Zanzibar AIDS Commission (ZAC), National Bureau of Statistics (NBS), and ORC Macro, 2008). Amongst pregnant women, strategies for prevention of vertical transmission of HIV may pose significant stress as many learn, often for the first time, of their HIV status. For example, evidence suggests less than half (between 22% to 40%) of pregnant women in Dar es Salaam, assessed two months after knowing their HIV positive serostatus and followed up to on average four years later, disclosed test results to their partners; fear of losing control over who knew their HIV status and subsequent isolation were the main reasons for non-disclosure suggesting a significant

degree of HIV stigma related stressors (Antelman *et al*., 2001). Distress, if significant, can limit women's ability to follow-through health care provider recommendations for preventing vertical transmission of HIV and access to HIV and AIDS care and treatment services. Thirdly, in addition to the immediate stressors related to a diagnosis of HIV disease, loss events, such as death of intimate partners, foetal loss and death of infants are not uncommon. The widespread loss of significant numbers of family members from HIV and AIDS curtails normal grieving and mourning practices and stretches families and communities beyond their capacity to cope with illness and grief; these impacts of HIV and AIDS go far beyond that of related disease conditions (MacNeil *et al*., 1999).

Finally, there is some evidence from both low and middle income countries that it is feasible to recognize and treat depression (Patel *et al*, 2009); and of the utility of psychotherapeutic and other interventions in depressed perinatal women (Dennis and Hodnett, 2007; Stuart *et al*., 2003), and rural SSA populations where prevalence of HIV and AIDS is high (Bolton *et al*., 2003). While a strong argument can be made for prioritizing research on the mental health status of women in sub-Saharan context such as Tanzania, based on the likely magnitude and morbidity imposed by such conditions, the high prevalence of HIV infection, the greater vulnerability of women to such infection and the socio-cultural context within which the double burdens of depression and HIV infection may occur in women of child-bearing age inform the need to determine rates of depression and associated risk factors in perinatal populations, in order to develop appropriate interventions.

EPIDEMIOLOGY OF PERINATAL DEPRESSION

There is limited systematic information on prevalence rates of significant psychopathology and mental disorders from population samples of pregnant and postnatal women in sub-Sahara African settings. However, there is a general global agreement that the prevalence of both anxiety and depressive disorders during the perinatal (pregnancy and the post-partum) period is high. Clinically, depression occurring in the perinatal period does not appear to differ qualitatively or in terms of risk factors from non-postnatal depression (Whiffen & Gotlib, 1993). Postnatal depression has perhaps more extensive research documentation than depression during pregnancy. However, in a review of studies that determined prevalence rates of perinatal distress, depression and anxiety, Austin (2004) showed that prevalence of depressive morbidity during pregnancy was as high as in the first few weeks post-partum. A review the prevalence of postnatal depression of studies predominantly conducted in developed countries showed a pooled prevalence rate of 13% (O'Hara & Swain, 1996). Rates of postnatal depression, however, have been reported to vary widely across the world (Halbreich & Karkun, 2006).

Delays in recognizing perinatal depression may result in low self esteem, ongoing problems in relationships with partners and children and in the ability to work. In low and middle-income countries such as Pakistan, India and Brazil (Stewart, 2007; Rahman *et al*., 2007; Patel & Prince, 2006; Rahman *et al*., 2004; Rondo *et al*., 2003) and in socially disadvantaged mothers in developed countries (Hoffman & Hatch, 2000; Rini *et al*., 1999; Hickey *et al*., 1995), perceived stress and depression during pregnancy have been independently associated with poor infant birth outcomes (low birth weight, preterm delivery or both). The mechanisms through which stress and perhaps depression are thought to cause poor birth outcomes include deregulation in hypothalamic pituitary adrenal axis functioning (Hobel *et al*., 2003; Wadhwa *et al*., 1996). These findings are however not consistent; an assessment of the impact of work stress during pregnancy on birth outcomes, found no association between stress and raised corticotrophin releasing hormone at 28 weeks gestation (Petraglia *et al*, 2001). Impairments in women's capacity to make appropriate decisions regarding their health and well being and that of the fetus and infant when depressed may be additional mechanisms that contribute to poor birth outcomes. Studies on the effects of postnatal depression on early childhood development in both developed and developing countries have shown deficits in the attention, cognition and brain functioning of infants (Murray *et al*., 1996a; Beck *et al*., 1995), with some indication of persisting effects when the infants become of school age (Murray *et al*., 1996b).

Previous non-perinatal depressive episodes have been identified as risk factors for depression during pregnancy suggesting a possible etiological role of biological and perhaps constitutional factors. A number of more proximal psychosocial risk factors of depressive morbidity during pregnancy have been identified including; low self esteem, negative cognitive style, antenatal anxiety, major/adverse life events, low income, and lack of social support and history of abuse (Leigh & Milgrom, 2008; Kazi *et al*., 2006; Rahman *et al*., 2003). The findings of three meta-analytic studies consistently showed antenatal depression, lack of social support, unemployment and low socioeconomic status were also important risk factors for postnatal depression (Beck, 2001; Beck, 1996; O'Hara & Swain, 1996). The recent Australian *beyond blue* National Postnatal Depression Program, that recruited and followed 367 antenatal clinic attendees to 12 weeks postpartum, showed antenatal depression mediated a number of identified psychosocial risk factors for postnatal depression including low income, history of abuse, major life events, antenatal anxiety, negative cognitive style, low self esteem and low social support (Leigh & Milgrom, 2008). Other studies have also shown antenatal anxiety (Austin *et al*, 2007; Heron *et al*, 2004) to be a risk factor for postnatal depression. Qualitative studies of depressed perinatal women in urban Indonesia (Andajani-Suthahjo *et al*., 2007) and India (Pereira *et al*., 2007) show somatic symptoms including pain and autonomic (difficulties breathing, palpitations, giddiness and fainting) and emo-

tional features of anxiety may be predominant expressions of distress, suggesting either co-morbid anxiety or an overlay of anxiety symptoms in the presentation of depression. Other risk factors reported include, a younger age (Rubertsson *et al*, 2005), lower level of education (Davis *et al*, 2003) and a history of foetal loss and pregnancy termination (Cryan *et al*, 2001).

Evidences from non-postnatal populations indicate women with HIV may be at a higher risk of depression. Chronic depressive symptoms have been reported in 42.0% of women with HIV (Ickovics *et al*. 2001) and HIV sero-positive women are four times as likely to have current major depression compared to women without HIV (Morrison *et al*., 2002). These observations raise concern of a possible double burden of risks for perinatal depression in large populations of perinatal women, as screening for HIV and AIDS is scaled up in antenatal clinic settings across SSA. In the SSA context, the prevalence of depression (defined as having a score at or above 23 on the Center for Epidemiological Studies Depression scale) was reported to be 47.0% in a clinical population of 1,017 Ugandan men and women (77.0% female) with HIV disease prior to anti-retroviral therapy initiation (Kaharuza *et al*. 2006). Rochat *et al*. (2006) also showed high rates of depression in South African and pregnant women recruited from antenatal care settings and screened for HIV infection.

MEASUREMENT OF PERINATAL DEPRESSION

The Edinburgh Postnatal Depression Scale (EPDS) (Cox *et al*. 1987) has been the most widely accepted depression screening scale used internationally in the perinatal period. Eberhard-Gran (2001) reviewed 10 studies that validated the EPDS against standardized clinical interviews to derive DSM-III, DSM-IIIR, DSMIV and ICD-10 major or minor depression criterion as the gold standard. The authors reported high variations in sensitivity (between studies ranged from 65-100%) and specificity (range 49 to 100%) with wide confidence intervals around these estimates in most of the studies reviewed. Positive predictive values for detection of depression were higher is studies that over-represented depressed women; and much lower than reported when the estimator was recomputed with a 13% assumption for the prevalence of postnatal depression. These findings suggested a greater utility of the EPDS as a screening tool in clinical than community settings where prevalence of postnatal depression is expected to be lower. Some studies have challenged the utility of a specific screening tool for perinatal depression and report equally satisfactory sensitivity and specificity estimators with screening tools not specifically developed for use in perinatal populations (Lee *et al*., 2001; Beck *et al*., 2001), suggesting that an assessment tool for clinical significant depression in a particularly setting might be sufficient for screening purposes. Despite concerns related to the positive predictive value on depression screening tools, Buist *et al*., (2002) also note

the utility of screening for depression in both the antenatal and postnatal periods, for the identification of distress may facilitate support, accurate diagnosis and treatment.

Whether assessed in the perinatal or other periods of the human lifecycle, affective experiences and expression of psychological phenomenon are increasingly recognized to be characterized by cultural-dependence (Lutz, 1985); with sometimes differences in various regions, countries and specific local cultures. While this awareness is apparent in current versions of diagnostic systems such as the Diagnostic and Statistical Manual version IV (Text Revision) (American Psychiatric Association, 2000), many standardized depression screening instruments that depend solely on a symptom criteria for diagnosis, are conceptualized in cultural contexts that differ greatly from contexts where they are used. During adaptation of standardized screening tools for use in developing contexts where fewer studies have been conducted, the inherent heavy bias towards Euro- American cultural descriptions of distress needs to be considered (Patel & Winston, 1994; Lutz, 1985; Kleinman, 1977). Culture is, however, a complex social construct that is not easy to define or measure. It includes the customs, civilization and achievements of a particular time or people, suggesting a dynamicity to its core features that increases challenges to understanding its influences on describing psychological phenomenon (Draguns & Tanaka-Matsumi, 2003). An anthropology of knowledge approach attempts to explain variation in the experience of reality by different individuals by reference to the notion that psychosocial reality is constructed by the positions held within a cultural system and our understanding of these positions. This idea has been systematically developed by various researchers from cultural (Hallowell, 1955), social worlds (Berger and Luckmann, 1967) and clinical (Kleinman, 1980; Friedson, 1970) perspectives. Within this framework, analytical and phenomenological priority is given to the terms in which people themselves construe their experiences. This approach may allow access to cultural knowledge systems, which constitute the structure of existence in fundamental ways that determine how people experience themselves. This particular characteristic of such knowledge systems, to some extent renders itself invisible to its bearer. Cultural knowledge, though relative to a particular socio-historical situation, appears to the bearer as the natural way of looking at the world (Berger and Luckmann, 1967 pp 8). Kleinman (1977) has questioned the validity of applying predominantly Euro-American diagnostic concepts to different ethnic groups and cautions on the potential for misclassification, for example when culturally sanctioned idioms for expressing distress are misinterpreted as diagnosable pathological phenomenon.

When comparing psychological and psychopathological entities across cultures, two ideological positions have been identified in the literature: a relativistic and a universalistic position (Draguns & Tamaka-Matsumi, 2003). Relativistic positions emphasize the uniqueness of phenomenon in different cultures, arguing that psy-

chopathological conditions can only be understood within the contexts where they occur. A more universalistic position, however, makes the case for common core features of psychopathological phenomena across cultural groups and focuses on understanding the extent and number of cross-cultural variations. This may perhaps shed some light on developing culturally equivalent constructs of psychological phenomena. Understanding of the potential contributions of these two positions to understanding cultural influences on psychopathology, allows for greater cultural sensitivity in order to reduce biases related to cultural differences in cross-cultural studies. Assessment of depressive morbidity depends on the ability of assessment tools to capture individual emotional experiences, associated cognitions, and behaviours within and across cultural groups. This, perhaps, is possible regardless of the instrument used to measure depression when the risk of culturally-sensitive biases is minimized. Van de Vijver & Poortinga (1997) report several culturally-sensitive biases to consider in psychiatry epidemiology; a) construct bias is related to the non-equivalence of constructs across cultural groups; b) method bias results from variations in instrument administration problems across cultural groups; and c) Item biases may be a result of inadequate translations including incorrect word choice.

In the Dar es Salaam context, while several terms in the almost universally spoken Kiswahili language exist to describe despondence as a symptom, a single local term or category describing an illness construct with similarities to a depressive syndrome has not been described. Preliminary analysis of survey data provided some prior indication that the construct of depression, bio-medically defined, would have resonance in pregnant women in the Dar es Salaam context. Lee *et al*. (2008) found that high depression scores on the HSCL-25 depression sub-scale, correlated with a lower perception of health-related quality of life. Furthermore, seven of the 10 most commonly endorsed Symptom Checklist-25 (HSCL-25) symptoms by pregnant women in Dar es Salaam were similar to commonly endorsed symptoms in an American population; six of these symptoms were depressive. However, some differences in item response patterns were evident Tanzanian women were more likely to endorse somatic of depression while the reporting of reflective or nervous symptoms was more common among American women. This suggested that representing distress in physical complaints may be a distinctive feature of the depressive experience in the Dar es Salaam setting. Factor analysis of the HSCL-25 items revealed a first factor describing a predominantly depressive construct. However, seven items overlapped between predominantly depressive and anxiety constructs, suggesting either a high overlay of anxiety symptoms in the presentation of depression or a more mixed picture in pregnant women seen in primary care settings. The analysis, however, did not allow for an understanding of meanings ascribed by participants to expressed emotional distress. These findings suggested that it would be appropriate to approach an understanding of the meanings and expression given to distress using Marsella's (1978) recommendation; that is, acknowledging that while

there may not be a universal notion of a biomedical definition of depression, there may be many variants of the condition across the world that may be similar in many important respects to those found in Western cultures.

The studies presented in this thesis attempt to address the paucity of information on depressive disorders in women during the perinatal period firstly by addressing the validity of depression as a viable construct in the Dar es Salaam context. The findings of formative qualitative research that aimed to understand expressions and local attributions of distress during pregnancy are described. The distribution and psychometric properties of local expressions of depression are determined from survey data that recruited pregnant women from antenatal care settings and finally a standardized depression symptom checklist is validated against diagnostic criteria in pregnant antenatal women living with HIV and AIDS. Secondly, the thesis will describe the magnitude of perinatal depressive morbidity, selected risk factors for depressive morbidity during pregnancy and influences of antenatal depressive morbidity on the progression of HIV disease. The studies draw from two prospective data sets. The first, recruited consecutive HIV status naïve antenatal clinic attendees at registration for antenatal care in primary health care settings and followed them up to a year after delivery; the survey was preceded by a formative mini-ethnographic inquiry into local understandings of pregnancy and distress. A psychosocial sub-study of a wider randomized controlled trial multivitamin intervention that aimed to reduce vertical transmission of HIV and AIDS and improve birth outcomes (Fawzi *et al*., 1999), provided the second database; the findings of the sub-study that included both HIV positive and negative women aimed to inform clinic based routine care and support for pregnant women living with HIV and AIDS. The next section summarizes the analyses presented in this thesis.

RESEARCH QUESTIONS

The review of literature as summarized above indicates methodological difficulties in measuring depressive morbidity using screening tools developed in a different cultural context. Authors report the importance of understanding local meanings and expressions of moods and emotions. In this thesis, formative research aims to describe idioms of emotional distress that are emphasized in recollections of women with prior experience of depressed mood (for at least two weeks) during pregnancy. Also the patterns in which idioms of emotional distress cluster with experiences of sadness will be described in order to elucidate unique ways in which depressed moods are expressed and whether similarities exist to a biomedical definition of a depressive syndrome. While an understanding of local idioms of distress is important, the relevance of the derived local idioms in the assessment of depressive morbidity will be determined by exploring endorsement distributions in an antena-

tal population accessing primary care services, secondly pooling local idioms with standardized symptoms of depressive disorder assessed using the Hopkins Symptom Checklist (HSCL-25) and determining features most predictive of high distress scores. The psychometric properties of the derived scale will be assessed. Also the thesis will determine constructs that explain most of the variance in scores of pooled local idioms of emotional distress and standardized features of depressive morbidity most predictive of emotional distress. It is hypothesized that emergent statistical constructs will have similar features to the local idioms clustering with experiences of sadness that emerge from the formative study. Finally, the HSCL-25 will be validated against DSM-IV diagnostic criteria for depressive disorder, in a population of pregnant antenatal clinic attendees that screen positive for HIV disease.

As noted in the review of literature, there is limited information on the prevalence of depressive morbidity in perinatal populations in Tanzania. This thesis will determine, prevalence of such morbidity in an antenatal primary care sample of pregnant women using an adapted version of the HSCL-25, calibrated to derive locally specific cut-off scores for depressive morbidity equivalent to DSM-IV depressive disorder. Several factors have been associated with depression during pregnancy as noted in the review of literature above. The thesis will also determine socio-demographic, economic, partner relationship and reproductive and health status measures that are associated with depressive morbidity during pregnancy. An important consequence of depressive morbidity described in the review of literature is the difficulty affected women experience in making decisions regarding both her own health and well being and that of her unborn baby or infant. The high prevalence of HIV and AIDS in the Tanzanian context as outlined above creates an even greater challenge to the pregnant and HIV positive woman in terms of accessing and utilizing services for prevention of maternal to child transmission of HIV disease and making decisions regarding feeding of her infant. This thesis will determine the effect of significant depressive symptoms, assessed during the prenatal period and a year post delivery, on clinical indicators of progression of HIV disease and all cause mortality in women living with HIV and AIDS recruited from antenatal clinics in Dar es Salaam. The hypothesis that depression occurring during pregnancy and/or one year after childbirth will increase the progression of HIV disease is tested.

The research questions are: (1) what idioms of distress are emphasized in recollections of women with prior experience of depressed mood (for at least two weeks) during pregnancy? (1.a) Do derived expressions of distress have similarities to a depressive syndrome? (1.b) Is the 25 item Hopkins Symptom Checklist (HSCL-25) a valid depression screening tool for use in pregnant women in Dar es Salaam? (2) What socio-demographic and economic factors are associated with symptoms equivalent to antenatal depressive disorder in HIV status naive women accessing

antenatal clinics at government primary health care facilities in Dar es Salaam? (3) What effect does the occurrence of significant depressive symptoms, assessed during the prenatal period and a year post delivery, have on clinical indicators of progression of HIV disease and all cause mortality in women living with HIV and AIDS recruited from antenatal clinics in Dar es Salaam?

Chapter 2 describes a formative ethnographic study that aims to describe local idioms of distress and how these idioms cluster with experiences of prolonged sadness. A cross-sectional study described in Chapter 3, recruited participants of unknown HIV serostatus from primary care antenatal clinics to determine the distribution of local emotional distress idioms and depressive symptoms, and the idioms and symptoms most predictive of high distress scores. Also the psychometric properties of a derived scale as well the statistical constructs that explained the most of the variance in their distribution is described. A two phased validation study of the HSCL-25 against DSM-IV depression criteria as gold standard is described in Chapter 4. This study recruited pregnant women accessing antenatal care that were screened for HIV and found to be positive. In chapter 5, a cross sectional study, determines the prevalence of morbidity equivalent to major depression in a sample of pregnant women accessing antenatal primary health of unknown HIV status. Sociodemographic, economic and other predictors of depression during pregnancy are also determined. A prospective study, described in Chapter 6, determines the effects of depression on clinical indicators of progression of HIV disease and all cause mortality in women living with HIV and AIDS recruited from antenatal clinics in Dar es Salaam. The thesis is closed by Chapter 7 by a discussion of the main findings, methodological reflections, practice implications and recommendations for future research.

REFERENCES

Abas, M. A., Broadhead, J. C., (1997). Depression and anxiety among women in an urban setting in Zimbabwe. *Psychological Medicine 27*(1): 59-71

American Psychiatric Association, (2000). *Diagnostic and statistical manual of mental disorders,* (4th ed., text revision). American Psychiatric Association: Washington, DC

Andajani-Sutjahjo, S., Manderson, L., & Astbury, J. (2007). Complex emotions, complex problems: understanding the experiences of perinatal depression among new mothers in urban Indonesia. *Cult Med Psychiatry*, 31(1), 101-122.

Antelman, G., Smith-Fawzi, M.C., Kaaya, S.F., Mbwambo, J.K., Msamanga, G., Hunter, D., Fawzi, W.W., (2001). Predictors of HIV-1 sero-status disclosure: A prospective study among HIV infected pregnant women in Dar es Salaam, Tanzania. *AIDS* 15(14): 1865-74

Austin, M.-P., Priest, S.R., (2005). Clinical issues in perinatal mental health: new developments in the detection and treatment of perinatal mood and anxiety disorders. *Acta Psychiatrica Scandinavica.* 112(2): 97-104

Beck, C.T., (1995). The effects of postpartum depression on maternal-infant interaction: a meta-analysis *Nursing Research* 44(5): 298-304

Beck, C.T., (1996). A meta-analysis of predictors of postpartum depression. *Nursing Research* 45(5): 297-303

Beck, C.T., Gable, R.K., (2001). Comparative analysis of the performance of the postnatal depression screening scale and other depression instruments. *Nursing Research* 50(4): 242-50.

Berger PL. and Luckmann T., (1967). The Social Construction of Reality: A Treatise in the Sociology of Knowledge. New York: Anchor-Doubleday.

Bhagwanjee, A., Perekh A., Paruk, Z., Petersen, I., Subedar, H. (1998). Prevalence of minor psychiatric disorders in an Adult, African rural community in South Africa. *Psychological Medicine* 28:1137-47

Bolton, P., Bass, J., Neugebauer, R., Verdeli, H., Clougherty, K. F., Wickramaratne, P., Speelman, L., Ndogoni, L., Weissman, M., (2003). Group interpersonal psychotherapy for depression in rural Uganda: a randomized controlled trial. *Journal of the American Medical Association* 289(23): 3117-24

Bolton, P.; Neugebauer, R.; Ndogoni, L., (2002). Prevalence of depression in rural Rwanda based on symptom and functional criteria. *Journal of Nervous and Mental Disease* 190(9): 631-7

Buist, A. E. Barnett, B. E. Milgrom, J. Pope, S. Condon, J. T. Ellwood, D. A. Boyce, P. M. Austin, M. P. Hayes, B. A., (2002). To screen or not to screen—that is the question in perinatal depression. *Medical Journal of Australia* 177 (Suppl.): S101-5

Cox, J.L., Holden, J.M., Sagovsky, R., (1987). Detection of depression. Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 150:782-85

Cryan, E., Keogh, F., Connolly, E., Cody, S., Quinlan, A., Daly, I., (2001). Depression among postnatal women in an urban Irish community. *Irish Journal of Psychological Medicine* 18(1): 5-10

Davis, L., Edwards, H., Mohay, H., Wollin, J., (2003). The impact of very premature birth on the psychological health of mothers. *Early Human Development* 73(1-2): 61-70

Dennis, C-L., Hodnett, E., Ross, (2007). Psychosocial and psychological interventions for treating postpartum depression. *Cochrane Database Systematic Reviews* (4) CD006116

Desjarlais, R., Eisenberg L., Good B., Kleinman A (1995). *World Mental Health: Problems and Priorities in Low-income Countries.* Oxford University Press: New York pp. 15-33.

Draguns, J.G. Tanaka-Matsumi, J., (2003). Assessment of psychopathology across and within cultures: issues and findings. *Behaviour Research and Therapy* 41(7): 755-76

Eberhard-Gran, M.; Eskild, A.; Tambs, K.; Opjordsmoen, S.; Samuelsen, S. O., (2001). Review of validation studies of the Edinburgh Postnatal Depression Scale. *Acta Psychiatrica Scandinavica* 104(4): 243-9

Fawzi, W.W., Msamanga, G.I., Spigelman, D., Urassa, E.J., Hunter, D.J, (1999). Rationale and design of the Tanzania Vitamin and HIV infection trial. *Controlled Clinical Trials* 20(1): 75-90

Friedson, E., (1970). Profession in Medicine: A Study of the Sociology of Applied Knowledge. New York: Harper and Row.

Gureje, O, Obikoya, B., Ikuesan, A., (1992). Prevalence of specific psychiatric disorders in an urban primary care setting. *East African Medical Journal* 69:282-7

Gureje, O., Kola, L., Fadahunsi, W., (2006)a. Mental health research capacity in Africa: Profile and Pattern: Mapping of mental health research in low- and middle-income countries. Global Forum for Health Research and World Health Organization.

Gureje, O., Lasebikan, V.0., Kola, L., Makanjuola, V.A., (2006)b. Lifetime and 12-month prevalence of mental disorders in the Nigerian Survey of Mental Health and Well-being. *British Journal of Psychiatry* 188(5):465-71

Gureje, O., Kola, L., Afolabi, E. (2007). Epidemiology of major depressive disorder in elderly Nigerians in the Ibadan study of aging: a community-based survey *Lancet* 370: 957-64

Halbreich, U., Karkun, S., (2006). Cross-cultural and social diversity of prevalence of postpartum depression and depressive symptoms. *Journal of Affective Disorders* 91(2-3): 97-111

Heron, J., O'Connor, T.G., Evans, J., Golding, J., Glover, V., (2004). The course of anxiety and depression through pregnancy and the postpartum in a community sample. *Journal of Affective Disorders* 80(1): 65-73.

Hickey, C.A., Cliver, S., Goldenberg, R.L., McNeal, S.F., Hoffman, H.J., (1995). Relationship of psychosocial status to low prenatal weight gain among non-obese black and white women delivering at term *Obstetrics and Gynaecology* 86(1): 177-83

Hobel, C., Culhane, J., (2003). Role of psychosocial and nutritional stress on poor pregnancy outcomes *Journal of Nutrition* 33 (5 Suppl. 2): 1709S-1717S

Hoffman, S., Hatch, M., (2000). Depressive symptomatology during pregnancy: evidence for an association with decreased foetal growth in pregnancies of lower social class women. *Health Psychology* 19(6): 535-43

Hollifield, M., Katon, W., Marojele, N., (1994). Anxiety and Depression in an out-patient clinic in Lesotho, Africa. *International Journal of Psychiatry in Medicine* 24(2): 179-88

Hollifield, M., Katon, W., Spain, D., Pule, L., (1990). Anxiety and depression in a village in Lesotho, Africa: comparison with the United States. *British Journal of Psychiatry* 156: 343-50

Hallowell, A.I., 1955 *Culture and Experience.* Philadelphia: University of Pennsylvania Press

Ickovics, J.R., Hamburger, M.E., Vlahov, D., Schoenbaum, E.E., Schuman, P., Boland, R.J., Moore, J., (2001). HIV Epidemiology Research Study Group. Mortality, CD4 cell count decline, and depressive symptoms among HIV sero-positive women. *Journal of the American Medical Association*; 285(11): 1466-74.

Jorm, A.F., (2000). Does old age reduce the risk of anxiety and depression? A review of epidemiological studies across the adult life span. *Psychological Medicine* 30(1): 11-22

Kaharuza, F.M., Bunnell, R., Moss, S, Purcell, D.W., Bikaako-Kajura, W., Wamai, N., Downing, R., Solberg, P., Coutinho, A., Mermin, J., (2006). Depression and CD4 cell count amongst persons with HIV infection in Uganda. *AIDS and Behaviour*; 10(4 Suppl.): s105-s111.

Kleinman, A., (1977). Depression, somatisation and the 'new cross-cultural psychiatry'. *Social Science and Medicine,* 11(1):3-10

Kleinman, A., (1980) Patients and Healers in the Context of Culture: An Exploration of the Borderline between Anthropology, Medicine, and Psychiatry. Berkley, Los Angeles, London: University of California Press.

Kazi, A., Fatmi, Z., Hatcher, J., Kadir, M.M., Niaz, U., Wasserman, G.A., (2006). Social environments and depression among pregnant women in urban areas of Pakistan: Importance of social relations. *Social Science and Medicine* 63(6): 1466-76.

Kebede, D., Alem, A. (1999). Major mental disorders in Addis Ababa, Ethiopia. II. Affective disorders. *Acta Psychiatrica Scandinavica* 100(Suppl 397):18-23

Kleinman, A (1980) Patients and healers in the context of culture: An exploration of the borderland between anthropology, medicine and psychiatry. University of California Press: Berkeley.

Lee, D.T. Yip, A.S. Chiu, H.F. Leung, T.Y. Chung, T.K., (2001). Screening for postnatal depression: are specific instruments mandatory? *Journal of Affective Disorders* 63 (1-3): 233-238

Lee, B., Kaaya, S.F., Mbwambo JK, Smith-Fawzi MC, Leshabari MT (2008) Detecting depressive disorder with the Hopkins Symptom Checklist-25 in Tanzania. *International Journal of Social Psychiatry* 54(1): 7-20

Leigh, B., Milgrom, J., (2008). Risk factors for antenatal depression, postnatal depression and parenting stress. *BMC Psychiatry* 8:24

Lutz, C., (1985). Depression and the translation of emotional worlds. In (Ed.) Kleinman A, Good B. *Culture and Depression*. University of California Press: Berkeley p. 63

MacNeil, J.M., Mberesero, F., Kilonzo, G.P., (1999). Is care and support associated with preventive behaviour among people with HIV? AIDS Care 11(5) 537-46.

Maier, W., Gansicke, M., Gater, R., Rezaki, M., Tiemens, B., Urzua, R.F., (1999). Gender differences in the prevalence of depression: a survey in primary care. *Journal of Affective Disorders* 53(3): 241-52

Marsella, AJ., (1978) Thoughts on cross-cultural studies on the epidemiology of depression. *Culture Medicine and Psychiatry* 2: 343-357.

Ministry of Health and Social Welfare, (2006). *The United Republic of Tanzania, Tanzania Mainland: Mental Health Policy Guidelines.* Ministry of Health and Social Welfare: Dar es Salaam

Monahan, P.O., Shacham, E., Reece, M., Kroenke, K., Ong'or, W.O., Omollo, O., Yebei, V.N., Ojwang, C., (2008). Validity/ reliability of PHQ-9 and PHQ-2 Depression Scales among adults living with HIV/AIDS in Western Kenya. *Journal of General Internal Medicine [in press Nov 20-2008]*

Morrison, M.F, Petitto, J.M, Ten Have, T., Gettes, D.R., Chiappini, M.S., Weber, A.L., Brinker-Spence, P., Bauer, R.M., Douglas, S.D., Evans, D.L., (2002). Depressive and anxiety disorders in women with HIV infection. *American Journal of Psychiatry* 159(5): 789-96.

Murray, L., Cooper, P.J., (1996)a. The impact of postpartum depression on child development. *International Review of Psychiatry* 8: 55–63

Murray, L., Fiori-Cowley, A., Hooper, R., Cooper, P., (1996)b. The impact of postnatal depression and associated adversity on early mother-infant interactions and later infant outcome. *Child Development* 67(5): 2512-26

O'Hara, M., Swain, A., (1996). Rates and risk of postpartum depression- a met analysis. *International Review of Psychiatry* 8: 37-54.

Orley, J., Wing, J.K., (1979). Psychiatric disorders in two African villages. *Archives of General Psychiatry* 36, 513-20

Ovuga, E., Boardman, J., Wasserman, D. (2005) The prevalence of depression in two districts of Uganda. *Social Psychiatry and Psychiatric Epidemiology* 40: 439-45

Patel V., Winston M (1994) "Universality of mental illness" revisited: Assumptions, artefacts and new directions. *British Journal of Psychiatry* 165: 437-40.

Patel, V., Todd, C., Winston, M., Gwanzura, F., Simunyu, E., Acuda, W., Mann, A. (1997). Common mental disorders in primary care in Harare, Zimbabwe: associations and risk factors. *British Journal of Psychiatry* 171: 60-4

Patel, V., (2006). Cultural factors and international epidemiology. *British Medical Bulletin* 57: 33-45.

Patel, V., Prince, M., (2006). Maternal psychological morbidity and low birth weight in India. *British Journal of Psychiatry* 188(3): 284-5

Patel, V., Simon, G., Chowdhary, N., Kaaya, S., & Araya, R. (2009). Packages of care for depression in low- and middle-income countries. *PLoS Med*, 6(10), e1000159.

Pereira, B., Andrew, G., Pednekar, S., Pai, R., Pelto, P., & Patel, V. (2007). The explanatory models of depression in low income countries: listening to women in India. *J Affect Disord*, 102(1-3), 209-218.

Petraglia, F., Hatch, M.C., Lapinski, R., Stomati, M., Reis, F.M., Cobellis, L., Berkowitz, G.S., (2001). Lack of effect of psychosocial stress on maternal corticotrophin-releasing factor and catecholamine levels at 28 weeks gestation. *Journal of Social and Gynecological Investigation* 8:83-8

Rahman, A., Bunn, J., Lovel, H., Creed, F., (2007). Association between antenatal depression and low birth weight in a developing country. *Acta Psychiatrica Scandinavica* 115(6):481-86

Rahman, A., Lovel, H., Bunn, J., Iqbal, Z., Harrington, R., (2004). Mothers' mental health and infant growth: a case-control study from Rawalpindi, Pakistan. *Child Care Health Development* 30:21-7.

Rahman, A., Iqbal, Z., Harrington, R., 2003. Life events, social support and depression in childbirth: perspectives from a rural community in the developing world. *Psychological Medicine*; 33:1161-1167.

Rini, C.K., Dunkel-Schetter, C., Wadhwa, P., Sandman, C., (1999). Psychological adaptation and birth outcomes: the role of personal resources, stress and socio-cultural context in pregnancy. *Health Psychology* 18(4): 333-45

Rochat, T.J., Richter, L.M., Doll, H.A., Buthelezi, N.P., (2006). Depression amongst pregnant rural South African women undergoing HIV Testing. *Journal of the American Medical Association,* 295(12):1376-8

Rondo, P.H., Ferreira, R.F., Nogueira, F., Ribeiro, M.C., Lobert, H., Artes, R., (2003). Maternal psychological stress and distress as predictors of low birth weight, prematurity and intrauterine growth retardation. *European Journal of Clinical Nutrition* 57(2): 266-72

Rubertsson, C., Wickberg, B., Gustavsson, P., Radestad, I., (2005). Depressive symptoms in early pregnancy, two months and one year postpartum-prevalence and psychosocial risk factors in a national Swedish sample. *Archives of Women's Mental Health* 8(2): 97-104

Rumble, S., Swartz L., Parry C., Zwarenstein, M., (1996). Prevalence of psychiatric morbidity in the adult population of a rural South African village. *Psychological Medicine* 26:997-1007

Schulsinger, F., Jablensky, A., (1991). The national mental health programme in the United Republic of Tanzania. A report from WHO and DANIDA. *Acta Psychiatrica Scandinavica* (Suppl.) 364:1-132.

Sokoya, O.O., Baiyewu, O., (2003). Geriatric depression in Nigerian primary care attendees. *International Journal of Geriatric Psychiatry* 18(6): 506-10

Stewart, R.C., (2007). Maternal depression and infant growth: a review of recent evidence. *Maternal and Child Nutrition* 3(2): 94-107

Stuart, S., O'Hara, M. W., Gorman, L. L., (2003). The prevention and psychotherapeutic treatment of postpartum depression. Archives of Women's Mental Health 6 (Suppl. 2): S57-69

Swartz, L., (1998). Culture and Mental Health: a Southern African View. Oxford University Press, Cape Town.

Swartz, L., McGougall, K., Breen, A., Legg, C., Schneider, M., (2005). Mental Health: Mapping of Research Capacity in Low and Middle-income Countries—Report for the Global Forum for Health Research and World Health Organization. Human Sciences Research Council, Cape Town.

Tanzania Commission for AIDS (TACAIDS), Zanzibar AIDS Commission (ZAC), National Bureau of Statistics (NBS), and ORC Macro, (2008). *Preliminary Report: Tanzania HIV/AIDS and Malaria Indicator Survey (THMIS) 2007-8.* TACAIDS, ZAC, NBS and ORC Macro: Calverton, Maryland, USA

UNAIDS, (2006). *Report on the Global HIV/AIDS Epidemic*. Joint United Nations Programme on AIDS: Geneva

United Nations Development Programme, (2007). Human Development Report 2007/2008: Fighting climate change; human solidarity in a divided world. Palgrave Macmillan: New York.

Ustun, T.B., Ayuso-Mateos, J.L., Chatterji, S., Mathers, C., Murray, C.J.L., (2004). Global burden of depressive disorders in the year 2000. *British Journal of Psychiatry* 184(5): 386-92

Van de Vijver, F. J., Poortinga Y.H., (1997). Towards an integrated analysis of bias in cross-cultural assessment. *European Journal of Psychological Assessment* 13(1): 29-37

Wadhwa, P.D., Dunkel-Schetter, C., Chicz-DeMet, A., Porto, M., Sandman, C.A., (1996). Prenatal psychosocial factors and the neuroendocrine axis in human pregnancy. *Psychosomatic Medicine* 58(5): 432-46

Weissman, M.M., Bland, R.C., Canino, G.J., Faravelli, C., Greenwald, S., Hwu, H.G., Joyce, P.R., Karam, E.G., Lee, C.K., Lellouch, J., Lepine, J.P., Newman, S.C., Rubio-Stipec, M., Wells, J.E., Wickramaratne, P.J., Wittchen, H., Yeh, E.K., (1996). Cross-national epidemiology of major depression and bipolar disorder. *Journal of the American Medical Association* 276(4): 293-99

Whiffen, V.E., Gotlib, I.H., (1993). Comparison of postpartum and non-postpartum depression: clinical presentation, psychiatric history, and psychosocial functioning. *Journal of Consulting and Clinical Psychology* 61(3): 485-94

World Health Organization, (1975). Organization of Mental Health Services in Developing Countries. Sixteenth Report of the WHO Expert Committee on Mental Health, December, 1974. World Health Organization Technical Report Series, No. 564. World Health Organization: Geneva.

World Health Organization, (2001). The World Health Report. Mental Health: New Understandings, New Hope. World Health Organization: Geneva

World Health Organization, (2005). *Mental Health Atlas 2005.* Mental Health: Evidence and Research Department of Mental Health and Substance Abuse. World Health Organization: Geneva.

Chapter Two

Understanding Women's Experiences of Distress during Pregnancy in Dar es Salaam, Tanzania

Manuscript accepted as: Kaaya S., Mbwambo J., Smith-Fawzi MC., van den Borne B., Schaalma H., Leshabari M.T. Understanding Women's Experiences of Distress during Pregnancy in Dar es Salaam, Tanzania. *Tanzania Journal of Health Research*

ABSTRACT

Several studies show depression is common during pregnancy. However, there is limited information in Tanzania on the magnitude of perceived distress during pregnancy and meanings ascribed to such distress. A descriptive survey collected data using unstructured interviews from 12 traditional practitioners and 10 periurban women with previous pregnancy related mental health concerns identified using a depression vignette. Study objectives included to describe the sources and characteristics of distress during pregnancy, and idioms of distress that could inform cultural adaptation of depression screening tools. Narrative analysis showed an emergent category of "problematic pregnancies" framed women's recollections of prolonged periods of sadness. This experience was qualified using various idioms of distress that were differentially emphasized depending on informant's perceived causes of health concern. The idiom *kusononeka* was consistently used to describe extreme sadness across causal categories and clustered with at least two typical features of major depression. This suggested existence of a construct with similarities to biomedical criteria for depression. "Thinking too much" emerged as a distinctive expression associated with prolonged sadness. Distinctive expressions of depression related social functioning impairments were identified that can inform depression severity assessments. Contextual inquiry into experiences of psychological distress showed distinct local idioms that clustered in patterns similar to symptoms of biomedical depressive episodes. Further studies to assess the utility of local idioms of distress and distress related functional impairments in depression assessment tools are warranted.

INTRODUCTION

Evidence shows 10% -15% of women suffer depressive disorders during pregnancy or in the first postnatal year (Josefsson *et al*., 2001, Weissman & Olfson, 1995). Studies indicate rates of depression during pregnancy are higher than or as high as in post-natal periods (Evans *et al*., 2001; Josefsson *et al*., 2001). Over a third of postnatal depressed women show high scores during pregnancy, suggesting persistence of pre-existing symptoms (Josefsson *et al*., 2001; Green & Murray, 1994). While few, studies examining prenatal depressive morbidity in sub-Saharan Africa (SSA), show higher symptom endorsement (Fatoye *et al*., 2004) and severity (Cox, 1979) in pregnant compared to non-pregnant women in Nigeria and Uganda respectively. Adewuya *et al*. (2006) showed an 8.3% point prevalence of DSM-IV depressive disorder during late pregnancy in Nigerian antenatal clinic attendees. This rate was higher than the 1.3% 12-month depression prevalence estimated in a Nigerian community-based sample of adults, where sex differentials in rates were minimal

(Gureje *et al*, 2006). While several context specific sources of stress in SSA may challenge pregnant women's mental health, the HIV epidemic particularly increases the potential for distress in women screened for prevention of vertical transmission of HIV infections. Pregnant women in Zambia, informed for the first time of HIV positive status, showed higher percent endorsements on depressive symptoms than women with prior knowledge (Kwalombota, 2002). Studies show between 41% (Rochat *et al*., 2006) and 43% (Antelman *et al*., 2007) of HIV positive pregnant women endorse symptoms equivalent to major depression, in South Africa and Tanzania respectively.

While methodological and instrumentation differences may partly account for variations in observed rates of perinatal depressive morbidity, the influence of culture on experience and communication of emotional distress cannot be ruled out (Flaherty *et al*, 1998; Lutz, 1985; Beiser, 1985). There are limited qualitative studies from the culturally diverse communities in SSA of experiences with pregnancy related psychological distress. Depression prevalence studies in SSA often rely on scrutiny of independent back translations for content and semantic equivalence of items when adapting standardized screening instruments (Adewuya *et al*., 2006; Fatoye *et al*., 2004; Cox, 1979). The inherent Euro-American ethnocentricity of depression screening tool items is however not addressed, raising questions regarding their cross-cultural utility (Lutz, 1985; Kleinman, 1977). Despite cross-cultural similarities in experiences of normal sadness, observed variations in the significance of depression as an illness category (Beiser, 1985) suggests the need for indepth understandings of cultural influences on expression of depressive illnesses. Local models of illness in SSA resembling depressive morbidity such as *kufungisisa* in Zimbabwe (Patel, 1998) and *guhahamuka* in Rwanda (Bolton, 2001) are described by some studies while others, note an absence of conceptually equivalent depression terms (Ihezue, 1989; Swartz *et al*, 1985). Indigenous illness names tend to be explanatory categories, for example possession by spirits, rather than fixed illness categories, further confounding comparisons with biomedical syndromes. Finally, cross-cultural variations in ways of understanding the body and self result in different meanings ascribed to and expressions of psychopathology. For example, somatisation may be a distinctive feature of depressive experience in some cultures, while in others psychological expressions dominate (Kleinman, 1986). Cultural variations in what depression symptoms different groups emphasize may create item bias, with similarities in total scores on a screening tool, but variations occur in individual item scores across different cultural groups (van de Vijver & Poortinga, 1997).

Formative research approaches are able to consider the unique conceptualizations and expressions of mood and hence can inform culture sensitive adaptation of mood measures (Halbreich *et al*, 2007). Such emic theoretical orientations in cross-cultural research pay attention to meanings particular groups ascribe to psychological phenomena (Lutz, 1985). The terms emic and etic support relativistic and univer-

salistic positions respectfully; they originate from the field of linguistics and explore the origins of concepts under investigation in cross-cultural research. Relativistic positions study psychological phenomenon from the perspective of given cultural groups, arguing for uniqueness of experience that is often at odds with universalistic positions that consider emotions as biological phenomena with a limited number of common emotional experiences across cultural groups (Draguns *et al*., 2003). Both positions can be integrated when combining observations from qualitative understandings of illness experiences (an emic orientation) in the development of sensitive measuring instruments (predominantly an etic activity) (Smit *et al*., 2006; Draguns *et al* 2003). These analyses report findings of a formative study that used emic theoretical approaches and aimed to understand experiences with psychological distress during pregnancy. The objective was to describe local idioms that would inform the cultural adaptation of a depression assessment tool.

METHODS

Study Area: The periurban ward of Chamazi with a relatively stable predominantly indigenous population of 8,868 residents, located 20 Km from the Dar es Salaam city centre was purposefully selected. Residents of the Msufini and Mbande villages of the ward engaged in agricultural and fishing activities, and had minimal wealth diversity. Both villages had no electricity, and were each served by a primary school and clean water sources from protected public and private boreholes. A shared dispensary provided antenatal and other primary health care services. Health care providers had limited awareness of depressive disorder.

Design and Key Informants Selection: Unstructured interviews collected data from traditional healers (TH) ("*mganga wa jadi*") and birth attendants (TBA) *("mkunga wa jadi")*, identified by village leaders as key providers of psychological health care. Six each of active TH and TBA were recruited as key informants. Traditional health practitioners identified, from a vignette illustrating core features of major depression (depressed mood for two weeks or more and loss of interest in usual activities), pregnant women attended in the past five years with health concerns similar to depression (previously affected women (PAW)) and sought their permission to be visited by the research team. Recruited PAW, though reticent on direct inquiry about psychological health problems, described personal experiences (n=8) or providing care for an affected pregnant relative (n=2), when presented with the depression vignette.

Description of Key Informants: Informants were of Bantu ethnicity, 69% (11 of 16) from the predominant Zaramo linguistic sub-group. All TH were males of mean age (SD) 61.2 (31.4) years and TBAs females, of mean age (SD) 63.0 (16.9) years. All THs and two TBAs were married; two each of the remaining TBAs were widowed or

divorced. Eight (n=5 TBAs) traditional practitioners had never attended formal schooling. One TBA had been schooled for only four years and three THs had completed seven compulsory years of primary education. PAW informants were younger of mean age (SD) of 29.2 (7.9) years, four each were currently partnered or living alone (one widowed, one separated and two had never lived with a partner). Six and three PAW had complete and incomplete primary education respectively while one had never attended school. Informants lived in multifocal families with on average of 5.2 (range 1-9) household members.

Data Collection Instruments and Study Procedures: Ethical clearance was provided by the Muhimbili University of Health and Allied Sciences (MUHAS). Unstructured interview guides, explored types and perceived causes of pregnancy related health concerns and related expressions of distress. Interviews with PAW, probed recollected experiences of distress during pregnancy, idioms of distress and sources of support. Written and verbal informed consent was sought prior to interviews and audio-records respectively. Two sociology graduates and the study investigators (JK, SK and ML) conducted one to two hour audio-recorded Kiswahili interviews in the homes of informants. Short field notes derived daily summaries and aided transcription of audio-records.

Data Analysis: Transcribed narratives were entered as text and uploaded into the Qualitative Solutions and Research (1997) QSR NUD*1ST version 4.0 software to facilitate data management, open coding and retrieval of coded data. Axial coding was used to identify and describe clusters of idioms of distress.

RESULTS

Social-cultural Institutions and Problematic Pregnancies

Initiation ceremonies were reported by informants to be the first formal social institution where women learnt about pregnancy and related norms and taboos that would ensure a safe delivery. Most PAW reported they had participated in initiation ceremonies (n=9), which were often postponed when menarche occurred prior to completing primary education. Respected female mentors *("kungwi"*) provided instruction to initiates on women's roles as daughters and wives. These related mainly to social reproduction, family values in the kin group, norms and taboos related to sexual conduct and pregnancy. A public ceremony ("*ngoma ya mkoleni*"[1]), hosted by the initiates families gave visibility to graduates of rites of passage to

[1] A 'coming-out' ceremony characterized by drums and dance (ngoma), that occurred under the Mkole tree that was associated with a woman's fertility. While timing of seclusion had changed due to the demands of formal education, narratives indicated its continued practice after completion of compulsory primary education (at age of about 14-15 years).

womanhood and herald onset of relative seclusion in the family home. Women described assisting in household chores during periods of seclusion, lasting two to three years and ending at marriage. A second period of formal instruction was reported in the seventh month of a first pregnancy. Instruction included what to expect and how to behave during the birth process. At a public 'clothes giving' ceremony *("ngoma ya kupewa nguo"*), pregnant women were formally introduced to the community of child bearing women. THs, usually male, played an active role in both the ceremonies including provision of protective amulets worn at all times henceforth by the woman.

Socio-economic, biomedical and supernatural factors emerged as causal categories for problematic pregnancies *("ujauzito wa matatizo),* a concept that was used by informants to describe problems they had experienced during pregnancy. Biomedical causes described as "God" given were distinguished from supernatural causes due to actions by persons or supernatural beings. Both were perceived less predictable of problematic pregnancy than socio-economic adversity. Matrix 1 summarizes characteristics of problematic pregnancy, protective or preventive measures and recollected idioms of distress.

"Socio-economic Adversity Almost Always Results in "Problematic Pregnancies."

Partners were expected to be the main source of support for pregnant women, with family assistance. Reluctance or inability to provide support was perceived to result in adversity, defined as lack of access to basic needs. Recollected distress due to poor support included bitterness in the heart/soul ("*kujihisi uchungu moyoni/rohoni*"), feeling sad as if in grief or mourning ("kusononeka"), or its converse, being unable to feel happy *("kuacha kucheka na kufurahi"*). PAW also recalled having many thoughts ("*kuwa na mawazo mengi*"), lack of energy ("*kukosa nguvu*"), feeling tired most of the time ("*kujisikia kuchoka muda mwingi*"), and bodily pains ("*maumivu ya mwili*"). Inability to attend to personal grooming ("*kutojali uonekano kimavazi na kujitunza*") and social withdrawal or aloneness ("*kujihisi mpweke" or "kunyongonyea", "kunyungurika*") was also reported. Not eating well and weight loss were perceived due to lack of access to food, or bitter taste in the mouth ("*uchungu mdomoni*") rather than loss of appetite.

Matrix 1: Affected women's accounts of sources of pregnancy related problems, perceived causes and experiences

Sources and protection	Perceived causes	Experiences and idioms used to communicate distress
Predictable "problematic pregnancies": No protection mentioned	Socio-economic adversity	Hunger; sadness as if grieved, feeling isolated and alone, feeling bitterness in the heart/soul, having many thoughts, loss of energy, feeling tired much of the time, forcing oneself to do normal chores, lack of attention to dressing, less laughter
Unpredictable "problematic pregnancies" *Protection:* Adhering to health care worker recommendations; Planning early for access to health facility in case of emergencies or help from relative(s)	Biomedical	Palmer and gum pallor; fever; fatigue; rapid heartbeats; shortness of breath; dizziness; swollen feet; poor weight gain; fear; headache, having many thoughts.
Protection: Adhering to sanctioned pregnancy related practices and wearing protective amulets	Supernatural Devil/spirit/shade possession	Irritability, conflicts with partner, sadness as if grieved, bad (or erotic) dreams, vaginal bleeding prior to term, foetal death and/or still births, rapid heartbeats, having many thoughts
	Active (being bewitched) and passive effects of malice, jealousy and/or envy ("bad eye")	Feeling physically unwell; headache; stomach ache, fear, irritability and difficulties being with people; having many thoughts; being overdue for delivery; delayed delivery of the placenta; sadness as if grieved; feeling like screaming or screaming without being aware of doing so; feeling tired much of the time, forcing oneself to do normal chores.
Protection: Avoid breaching taboos	Infringing taboos related to pregnancy	Prolonged labour; retention of the placenta; excessive bleeding during labour; still birth, maternal death and fear of labour

Perceived Biomedical Causes of Problematic Pregnancy

Malaria, anaemia and poor diet were the main biomedical causes of problems during pregnancy mentioned. Malaria was attributed to mosquito bites transmitting an illness that caused fever ("*homa*[2]"), headaches, and sometimes abortions. Anaemia ("*kukosa damu*"), was experienced as a laboratory blood test result, palmer and gum pallor, fatigue ("*kuchoka*"), shortness of breath ("*kukosa pumzi*"), fear ("*uwoga*"), rapid heartbeats ("*mapigo ya moyo kwenda kasi*") and having many thoughts ("*kuwa na mawazo mengi*"). PAW defined nutritious foods as fish, meat, milk, green vegetables and fruits. Poor diet was reported to result in both anaemia and limited achievement of expected weight gains at antenatal assessments. While rarely acknowledged by informants, it is likely experiences such as increased heartbeat, shortness of breath and fatigue were related to having "many thoughts" about health or food security. The inability to predict problems due to biomedical causes is illustrated in the following quotation.

[2] Literally translates to fever in English but the conceptual equivalence was broader ranging from chills with rigor to feeling unwell with generalized body malaise

"….not having enough blood and insufficient body fluids both cause a lot of worry ….there is also malaria. Even without these problems, things can change very quickly close to delivery and a woman can lose a lot of blood and fluids and even die. These things cause many thoughts during pregnancy (PAW; 26 years old; married, housewife with four children; primary school graduate)

Following dietary advice of health care providers and preparedness for the unexpected, were ways to prevent problematic pregnancies. Being prepared meant saving money for transport to a health facility, and having someone with, often an older female relative, who could help during late pregnancy and close to delivery.

"Pregnant Women are Vulnerable to Supernatural Influence"

Three reported sub-categories of supernatural causal factors included possession by devils ("*shetan"i*[3]), spirits ("*majini*"), or shades ("*mizimu*"); bewitchment due to malice or the "evil eye" evoked by envy; and breaching pregnancy taboos.

'Spirit Possession,' Envy and Malice Cause "Problematic Pregnancies": Devils and spirits were described as invisible agents that were stepped on accidentally or "climbed on/into" to otherwise harm a person. Pregnant women were perceived to be particularly vulnerable to spirit possession, which was evidenced by conflict, altered mood and physical concerns. Symptoms included frequent conflicts with partners *("kutoelewana na mwenzi"*), irritability (*"kuudhiwa*"), sadness as if grieved *("kusononeka*"), bad or erotic dreams ("*njonzi mbaya au za kuingiliwa*"), rapid heartbeats *("mapigo ya moyo kwa kasi"*), having many thoughts ("*kuwa na mawazo mengi*"), vaginal bleeding ("*kutoka damu ukeni*"), intrauterine foetal death *("mtoto kufia tumboni*"), and still births ("*kujifungua mtoto si riziki"*). All informants reporting spirit possession (n=3) described significant conflict with partners prior to pregnancy and spirit possession was always implicated as illustrated by the following quote:

"… This state of feeling sad as if grieved (kusononeka) is due to being irritated when there is no cause. It is the result of a bad bug that is "jini mahaba". It makes a man or woman sulk for no reason and the two can split up… because the jini wants an exclusive relationship with the woman, and can also ruin the pregnancy." (PAW, 36 years old, separated with four children; no formal education)

Envy from others during pregnancy was a recurring theme. Active acts of jealousy with malicious use of witchcraft, though distinguished from more passive influences of envious thoughts, were described to have similar effects. These included low energy *("mwili kukosa nguvu*"), headache or stomachache *("maumivu ya ki-*

[3] Shetani and jini were used interchangeably by PAW; TH perceived jini to be a category of spirits, with intentions not always considered evil as often implied by the term shetani. In this largely Muslim community, users of the term may have implied the more negative connotation of shetan as used in Koranic vocabulary where the term can more closely be translated to mean the Devil.

chwa au tumbo"), fear ("*uwoga"*), irritability *("kuudhiwa*"), being unable to interact with people ("*kutoweza kujumuika na watu*"), many thoughts ("*mawazo mengi"*), post delivery date pregnancies *("kufungwa mimba")*, feeling sad and as if grieved ("*kusononeka"*), wanting to scream, or screaming without being aware of doing so ("*kuhisi kupiga kelele" or "kupiga kelele bila kujiju*a"), and needing to force oneself to do household chores ("*kujilazimisha kufanya shughuli za kawaida*"). The following quotation illustrates attribution of ill health to envious thoughts in a situation a PAW could not communicate concerns to her partner:

"…I went to the hospital because of the headaches; …they took some blood and urine tests and everything was normal. I got along well with my co-wife, but I worried because she has no children, maybe her envy was the cause? … I talked to my father… we agreed he suggests to my husband that my illness may be due to "mizimu" (shades), and that I should move to my parent's home for care.." (PAW; 26 years old; second wife with four children; primary school graduate)

Amulets worn during pregnancy were perceived to prevent spirit possession and bewitchment. Interventions in the event of spirit possession included healing rituals mediated by THs who made known the demands of spirits to partners and family members. Responses would include offerings of gifts (often clothes and jewellery) to the affected woman to appease spirits. Women were also instructed to take good care of "identifying items" such as clothes, hair, the after birth, and dried remnants of the umbilical cord that could be used to harm, if acquired by persons with malicious intentions.

"Breaching Pregnancy Related Taboos Causes Problems during Delivery": Most described taboos protected against poor pregnancy outcomes. The infidelity taboo for example, was most consistently described and applied to both partners during pregnancy. Described consequences of infidelity included prolonged labour, still births, excessive bleeding during child birth, retention of the placenta, and maternal death. "Mixing bodily fluids" of different persons was perceived harmful to the foetus or at childbirth as illustrated by the following quote from a TBA:

"….once you make a person pregnant, stick to that person until a healthy baby is born—- our children don't listen these days and continue other relationships and as a result, women get problems during delivery. The Zaramo say every person with his own fluid and it is not good to mix fluids". (TBA; 75 years old, divorced with four children; no formal education)

PAW described limitations in protecting their unborn infants and themselves from consequences of infidelity, due to limitations in their control over sexual behaviours of partners. They also described fear of impending childbirth should one unwittingly breach taboos (n=3) and distress when accused by TBAs of breaching taboos when complications of labour occurred (n=2).

"Problematic Pregnancies" and Clustering of Expressions of Distress

Prolonged sadness was not perceived to occur for no reason, and was often attributed to malaise, pain (abdominal and/or headaches), or socio-economic adversity. Idioms used to qualify experiences of unhappiness included sadness as if grieved and bitterness in the heart or soul. Sadness as if grieved *("kusononeka"*) was consistently described as an experience more extreme than normal sadness, prohibiting abilities to perform household chores by making the feet heavy and numb and slowing down movements. Interpersonal difficulties (being unable to interact with people and conflicts with intimate partners) were not surprisingly reported with irritability, tenseness, and headache and whirling or heat sensations in the head, as illustrated in the following PAW's narration:

"…. I don't know how I felt. My head was not right, I had pain and tension, and I was not feeling good and was angry when I was with people. Sometimes I was so irritated by people and felt like screaming..." (PAW; 26 year old; second wife with four children; primary school graduate)

Experiences of low energy and being frequently tired were the only idioms of distress that reportedly could occur for no reason. Accounts of feeling tired all the time consistently co-occurred with having many thoughts and varying impairments in social functioning. The following quotation is illustrative:

"…. Feeling tired all the time and alone causes many thoughts; the life inside a woman's home is sometimes very difficult. Women think about whether they have eaten well (recommended nutritious foods), have enough food, have clothes for themselves and the baby, and these worries bring more weakness, sadness and there is pain in the whole body" (PAW4, 40 year old widow, primary school graduate with 7 children)

As illustrated in the quotation above, having many thoughts was frequently described in response to pregnancy related worries and concerns, regardless of perceived causes, and as a reason for pain and feeling frequently tired.

DISCUSSION

Women and traditional practitioner key informants all perceived pregnancy as a normal phenomenon and positive outcomes (healthy infant and mother) were generally anticipated. Good (1994) suggests that just as biomedical diagnostics and treatment procedures construct a particular number of objects for transformation through therapeutic interventions, non-medical healing practices similarly construct objects for transformation through both protective and healing interventions. Traditional initiation and pregnancy related institutions, provided norms and normative values for practices facilitating a "safe" pregnancy, hence objectifying agents of future problems during pregnancy. An emergent category, the "problematic preg-

nancy" *("ujauzito wa matatizo),* framed women's recollected experiences of distress. PAW, when prompted, were willing to acknowledge, express and qualify experiences of sadness during pregnancy. A consistent idiom expressing extreme sadness, "*kusononeka"*, sometimes associated with cognitive and behavioural idioms of distress and always with impairments in social functioning emerged. Finally reported idioms of distress clustered in certain patterns, within and across perceived causes of problematic pregnancy.

In these analyses, women often attributed depressed mood to physical complaints or socio-economic difficulties. Similar attributions of depressed mood were shown in a study that recruited informants from two regions of Tanzania who represented 35 tribal affiliations (Whyte, 1991). The emphasis given to somatic and cognitive complaints when describing emotional distress within emergent causal categories of "problematic pregnancies" may suggest absence of a mind-body division, implied to be a Western Cartesian dichotomy (Scheper-Hughes and Lock 1987; Wen 1998). However, PAW's initial reticence to discuss "psychological health" problems, may suggest informants did make mind-body illness distinctions. Kohrt and Harper (2008) explored the ethno-psychology of mind–body dichotomies in Nepal and showed, rather than a lack of mind–body division, emphasis on bodily presentations of psychological distress reflects presence of such divisions and the stigma associated with mental illness. These analyses did not allow exploration of influences of stigma on expressions of distress, however, negative attitudes towards mental disorders in Tanzanian communities have been reported (Whyte, 1991), as well as high felt and enacted stigma scores in facility-based ambulatory patients with mental disorder (Philip, 2003).

Reported idioms of distress clustered in distinctive patterns within perceived causes of problematic pregnancy suggesting influences of causal explanatory models on idioms of distress emphasized in women's recollections. For example, accounts of sadness occurred with feelings of bitterness and loneliness when socio-economic factors were perceived to cause health problems. There is evidence that shows stressful life events are common and associated with depression in low income urban women in SSA (Broadhead *et al*., 2001). With spirit possession attribution however, sadness clustered with irritability and interpersonal conflict, particularly with partners. Studies show conflicts with intimate partners can both be a result of perinatal depression (Kazi *et al*., 2006; Hart *et al*., 2006), and a risk factor for perinatal depression across diverse cultural settings (Pajulo *et al*., 2001; Bolton *et al*., 1998; Farber *et al*., 1996). In the study context of low socio-economic status and multifocal family structures, the need to foster supportive social networks may perhaps be greater, and could explain the significance informants gave to both feelings of aloneness and interpersonal conflict. Attribution of conflict to possession states may be a distinctive expression of distress associated with interpersonal conflict in intimate relationships. There is some evidence that questioning, by women,

of distressing issues related to intimate relationships such as partner infidelity is not be acceptable (Lary *et al*., 2004). This interpretation is perhaps supported by the symbolism evident in descriptions of TH mediated treatment of spirit possession; were an acceptable and safe environment is provided for women to express discontent in their personal lives through the medium of spirits. Features of fear and anxiety predominated accounts of idioms of distress when biomedical causes of pregnancy related problems were reported. Expressions of fear and anxiety when biomedical causes of health problems were perceived by informants may perhaps be realistic, given maternal mortality estimates of 43.1-123 per 100,000 women aged 15-49 years (Mswia *et al*., 2003) in community-based samples and 754 maternal deaths /100,000 live births (Alloo, 1994) at a tertiary referral health facility serving the study area.

At least two symptoms, low energy or excessive fatigue and loss of interest in activities, were similar to ICD-10 (WHO, 1992) typical features of depressive episodes and clustered with sadness across more than one perceived cause of ill health. However, "having many thoughts" a symptom that clustered with sadness across all the causal categories is not an ICD-10 defined feature of depression and should be considered a culturally distinctive expression of depression. The idiom of "thinking too much" that closely resembles "having many thoughts" was similarly shown to be a significant idiom of distress in depressed Zimbabwean women (Patel, 1998). Informant's descriptions of somatic concerns such as headache and stomach pains are also not ICD-10 features of major depression; however, similar symptoms have been reported to be common presentations of depression in other primary care settings (Escobar *et al*., 2006; den Boer *et al*., 2002). A possible source of pain could be an amplification of normal bodily aches and pains when depressed. Kelly *et al* (2001) also showed physical health symptoms were amplified in depressed pregnant women. Subjective accounts of difficulties in social role functioning (household chores, and social interaction) and personal grooming, provides context specific information on functional impairments that may be important guides in the assessment of depression severity in this population sub-group (WHO, 1992).

There are limitations in generalizing accounts of informants from a single locality given the 125 linguistic groups of Tanzania. It can, however, be argued that the Bantu are the largest ethnic group in the country, with similarities in customs across linguistic sub-groups. Common use of the Kiswahili language throughout Tanzania may also facilitate diffusion of the cultural structuring of pregnancy experiences and related meanings and expressions of distress during this period of women's life cycle. The five year recall timeframe required of PAW informants was a second limitation. Though it was anticipated that experiences of significant distress would be recalled, the potential for recall bias cannot be ruled out. The process of selection of PAW informants most able to provide the required information and triangulation by comparing and contrasting accounts from different types of informants

may also increase the validity of study findings. Despite these limitations, information is provided that can inform adaptation of tools for future quantitative study of depression.

In conclusion, contextual inquiry into experiences of psychological distress showed distinct local idioms that clustered in patterns similar to symptoms of biomedical depressive episodes. Further studies to assess their utility in depression assessment tools are warranted.

Acknowledgement

Authors thank study participants and research assistants, particularly Ms. Violet Mrema. Institutional support from the Muhimbili University and funding support from the Canadian International Development and Research Council made these analyses possible.

REFERENCES

Adewuya, A.O., Ola, B.A., Aloba, O.O., Dada, AO, Fasoto, O.O., (2006). Prevalence and correlates of depression in late pregnancy among Nigerian women. *Depression and Anxiety*, 0:1-7

Alloo, F., (1994). Maternal mortality and morbidity. Women's reproductive health in Tanzania. *Women's Global Network for Reproductive Rights*, 46:12.

Antelman, G., Kaaya, S., Wei, R., Mbwambo, J., Msamanga, G.I., Fawzi, W.W., & Fawzi, M.C. (2007). Depressive symptoms increase risk of HIV disease progression and mortality among women in Tanzania. *Journal of Acquired Immune Deficiency Syndrome*, 44(4), 470-477.

Beiser, M., (1985). A study of depression among traditional Africans, urban North Americans, and South Asian refugees. In Ed. Kleinman A, Good B. *Culture and Depression*. Berkeley: University of California Press, p. 272

den Boer, J.A., Evans, D.L., Lee, S., Salin-Pascual, R., (2002). Unravelling the diagnostic clues of depression and GAD: The primary care challenge. *Psychopharmacology Bulletin,* 36 (Suppl. 2): 150-7

Bolton, P. (2001). Local perceptions of the mental health effects of the Rwandan genocide. *Journal of Nervous and Mental Disorders*, 189(4), 243-248.

Broadhead, J., Abas, M., Sakutukwa, G. K., Chigwanda, M., Garura, E., (2001). Social support and life events as risk factors for depression amongst women in an urban setting in Zimbabwe. *Social Psychiatry and Psychiatric Epidemiology*, 363:115-22

Cox, JL. (1979). Psychiatric morbidity and pregnancy: a controlled study of 263 semi-rural Ugandan women. *British Journal of Psychiatry*, 134: 401-405

Draguns, J.G., & Tanaka-Matsumi, J. (2003). Assessment of psychopathology across and within cultures: issues and findings. *Behaviour Research and Therapy,* 41(7), 755-776.

Escobar, J. I., Interian, A., Diaz-Martinez, A., Gara, M., (2006). Idiopathic physical symptoms: a common manifestation of psychiatric disorders in primary care. *CNS Spectrums*, 11(3): 201-10

Evans J., Heron J., Francomb H., Oke S., Golding J. (2001) Cohort study of depressed mood during pregnancy and after childbirth. *British Medical Journal,* 323:257-260

Fatoye F.O., Adeyemi A.B., Oladimeji B.Y. (2004) Emotional distress and its correlates among Nigerian women in late pregnancy. *Journal of Obstetrics and Gynaecology*, 245; 504-509

Green J., Murray D., (1994) The use of the Edinburgh Postnatal Depression Scale in research to explore the relationship between antenatal and postnatal dysphoria. In Cox J, Holden J eds. *Perinatal Psychiatry.* London: Gaskell, p. 180.

Gureje, O., Lasebikan, V.0., Kola, L., Makanjuola, V.A., (2006). Lifetime and 12-month prevalence of mental disorders in the Nigerian Survey of Mental Health and Well-being. *British Journal of Psychiatry,* 1885:465-471

Halbreich, U., Alarcon, R.D., Calil, H., Douki, S., Gaszner, P., Jadresic, E., Jasovic-Gasic, M., Kadri, N., Kerr-Correa, F., Patel, V., Sarache, X., & Trivedi, J.K. (2007). Culturally-sensitive complaints of depressions and anxieties in women. *Journal of Affective Disorders,* 102(1-3), 159-176.

Hart, R., McMahon, C.A., (2006). Mood state and psychological adjustment to pregnancy. Archives of Women's Mental Health, 9:329-337

Ihezue, UH (1989) The influence of socio-cultural factors on symptoms of depression. In Ed. Peltzer K, Ebigbo P. Clinical Psychology in Africa. Chuka Printing: Enugu, Nigeria p. 217.

Josefsson, A., Berg G., Nordin C., Sydsjö G. (2001) Prevalence of depressive symptoms in late pregnancy and post-partum. Acta Obstetricia Et Gynaecologica Scandinavica, 80: 251-255

Kazi, A., Fatmi, Z., Hatcher, J., Kadir, M.M., Niaz, U., Wasserman G.A., (2006). Social environments and depression among pregnant women in urban areas of Pakistan: Importance of social relations. Social Science and Medicine, 63: 1466-1476.

Kelly, R. H., Russo, J., Katon, W., (2001). Somatic complaints among pregnant women cared for in obstetrics: normal pregnancy or depressive and anxiety symptom amplification revisited? General Hospital Psychiatry, 23(3): 107-113

Kleinman, A.M., (1986) Social Origins of Distress and Disease: Depression, Neurasthenia and Pain in Modern China. Yale University Press, New Haven CT.

Kleinman, A., (1977) Depression, somatisation, and the "new cross-cultural psychiatry." Social Science and Medicine, 11:3-9

Kohrt, B.A, Harper, I., (2008). Navigating diagnoses: Understanding mind–body relations, mental health, and stigma in Nepal. Culture Medicine and Psychiatry, 324:462–491

Kwalombota, M. (2002). The effect of pregnancy in HIV-infected women. AIDS Care, 14(3), 431-433.

Lary, H., Maman, S., Katebalila, M., McCauley, A., Mbwambo, J., (2004). Exploring the association between HIV and violence: young people's experiences with infidelity, violence and forced sex in Dar es Salaam, Tanzania. International Family Planning Perspectives, 304: 200-206

Lutz C., (1985). Depression and the translation of emotional worlds. In Ed. Kleinman A, Good B. Culture and Depression. University of California Press: Berkeley

Mswia, R., Lewanga, M., Moshiro, C., Whiting, D., Wolfson, L., Hemed, Y., Alberti, K.G., Kitange, H., Mtasiwa, D., Setel, P., (2003). Community-based monitoring of safe motherhood in the United Republic of Tanzania. Bulletin of the World Health Organization. 812:87-94

Patel, V., (1998). Culture and Common Mental Disorders in Sub-Saharan Africa. Maudsley Monographs 41, Psychology Press, East Sussex.

Phillip, F., (2003). Stigma towards mental illness: The experience of mentally-ill patients and relatives attending the psychiatric unit, Muhimbili National Hospital. A Dissertation Submitted in Partial Fulfilment of the Requirements for the Degree Master of Medicine in Psychiatry of the University of Dar es Salaam. University of Dar es Salaam: Dar es Salaam

QSR NUD1ST, (1997). QSR NUD1ST version 4.0. Doncaster: Qualitative Solutions and Research International Pty

Rochat, T.J., Richter, L.M., Doll, H.A., Buthelezi, NP., (2006). Depression amongst pregnant rural South African women undergoing HIV Testing. Journal of the American Medical Association, 29512:1376-1378

Scheper-Hughes N., Lock M.M., (1987). The mindful body: A prolegomenon to future work in medical anthropology. Medical Anthropology Quarterly, 11: 6-41

Smit, J., van den Berg, C.E., Bekker, L.G., Seedat, S., & Stein, D.J. (2006). Translation and cross-cultural adaptation of a mental health battery in an African setting. African Health Sciences, 6(4), 215-222.

Swartz L, Ben-Arie O, Teggin AF (1985). Sub cultural delusions and hallucinations. Comments on the Present State Examination in a multi-cultural context. British Journal of Psychiatry, 146: 391—394.

van de Vijver, F.J.R., Poortinga, Y.H. (1997) Towards and integrated analysis of Bias in cross-cultural assessment. European Journal of Psychological Assessment, 13(1): 29-37

Wen, J.K., (1998). Folk belief, illness behaviour and mental health in Taiwan. Chang Keng i Hsueh Tsa Chih 211: 1-12.

Weissman, M.M., Olfson, M., (1995). Depression in women: Implications for health care research. Science 269:799-801

Whyte SR (1991) Attitudes towards mental health problems in Tanzania Acta Psychiatrica Scandinavica suppl. 364: 59-76

World Health Organization 1992 The ICD-10 Classification of Mental and Behavioural Disorders: Clinical descriptions and diagnostic guidelines. Oxford University Press: Madras

Chapter Three

Detecting Depressive Disorder with a 19-Item Local Instrument in Tanzania

Manuscript published as: **Kaaya SF**, Lee B, Mbwambo JK, Smith-Fawzi MC, Leshabari MT. (2008) Detecting depressive disorder with a 19-item local instrument in Tanzania. *International Journal of Social Psychiatry,* 54(1):21-33.

ABSTRACT

Experiences during validation of the Hopkins Symptom Checklist-25 (HSCL-25) in a Tanzanian population, showed calibration at a low mean cut-off score for clinically significant morbidity. This study attempted to develop a local screening tool employing indigenous expressions of distress in women of child bearing age. Thirty ethnographically derived local idioms were added to HSCL-25 items and the final 47-item questionnaire administered to 787 antenatal clinic attendees. Logistic regression identified 19 items for the Dar-es-Salaam Symptom Questionnaire (DSQ), which demonstrated good internal consistency (Cronbach's α= 0.84), inter-rater reliability (intra class r = 0.89), and test-retest reliability (intra class r = 0.82). Content and discriminant validation of the scale conformed to expectations, but depressed affect failed to emerge as an important item. Locally derived expressions may aid in the reporting of illness and illness severity. Further studies are recommended to uncover universal aspects and culturally specific manifestations of illness expression.

Introduction

Depression is one of the most important causes of morbidity in the developing world, especially among women (Abas & Broadhead, 1997), and is part of a vicious circle of poverty, depression, and disability. Yet there remains a paucity of information as to its exact manifestations and consequences in parts of the world that are most vulnerable, in terms of both symptom constellation and health care needs, which further prevents its detection and treatment. Previous data pointed to limitations in applying Western illness categories in the Tanzanian setting (Lee *et al*, in press). Meanwhile, the World Health Organization multinational study of common mental disorders in general medical care settings (Üstün *et al*, 1995) demonstrated the need for locally relevant identification strategies (Patel & Winston, 1994). Depression, in particular, seems ubiquitously to carry ethnocentric conceptualization (Kleinman, 1977; Marsella, 1978); cross-cultural reviews (Prince, 1968; Rwegellera, 1981; Weiss & Kleinman, 1988) have suggested, for example, that guilt feelings, self-deprecation, severe retardation, and associated suicidal behaviour are more specific to the West. German (1987) goes further to claim that the issue may not be whether individual symptoms are present or absent, but which symptoms given groups emphasize—for equal feelings can differ in presentation by perceived relevance. Similarly, Patel and colleagues (1995) found that somatic symptoms are often cultural metaphors that most patients do not attribute to a somatic illness, as in "pure" somatisation, which means that it is vital to understand the culture-specific terminology and to assess mood in those with multiple somatic complaints.

The premise of the study illustrated in this paper is that understanding illness experience, using indigenous explanatory models and illness categories (Patel *et al.*, 1995), can be useful in the development of detection strategies. The Hopkins Symptom Checklist-25 (HSCL-25) has been validated in various cross-cultural settings

(Mollica *et al*, 1987; Hinton *et al*, 1994; McKelvey & Webb, 1997) as well as in the same population (Lee *et al*, 2008). However, the absence of effective detection is a major impediment to the management of mental disorder in Africa (WHO, 1986), and the latter study indeed revealed poor differentiation of severity, probably due to low endorsement levels. The aim of this paper is therefore to develop the Dar-es-Salaam Symptom Questionnaire (DSQ), a locally sensitive screening device. This study drew from a women's clinic population that was chosen for study because of initial ethnographic studies suggesting that pregnancy, viewed as a normal phenomenon, might encourage admission of psychic stress in a culture that heavily sanctions the expression of depression (Unpublished manuscript). Information obtained from these women would be used as the initial step to developing a general depression screen for a wider primary care population. The hypothesis of this paper is that an instrument of local idioms could elucidate important aspects of illness experience and expression not readily identified by scales developed without cultural sensitivity. The rationale for this study is that such detection strategies could help reduce the morbidity and mortality associated with this common illness.

METHODS

Sample

The primary healthcare antenatal clinics for the rural Chamazi (population 5,367) and peri-urban Mbagala (population 80,255) Wards were selected from the Temeke District of the Dar es Salaam Region of Tanzania for study. Because the purpose was to expand the screening tools for the general population, who are much less prone to admitting depressive symptoms, antenatal clinic attendees were selected as a preliminary step. The study was conducted in two stages: (i) development of a locally derived instrument using ethnographic information from key informants; and (ii) administration of a scale of locally derived expressions.

Development of the local instrument initially involved the following three steps: First, using the health facility as an entry point, 40 key informants were identified per village using a snowball format, focusing on women's groups, traditional healers, village health workers, and village leaders. Secondly, based on informal discussion, ten were selected for in-depth interviews to obtain information on the symptoms and signs, course, causality, and perceptions on the best treatment strategies. These key informants then distinguished a second group comprising ten women who were suffering or had suffered from any of the local categories of illness, who were then interviewed in-depth on their experiences, with open-ended questions, including about their predominant complaints, treatment course, and social supports during the episode.

For the second stage of the study, participants for administration of the scales were recruited (n = 787) among antenatal clinic attendees of gestational age between 28 and 36 weeks. After providing information on the purpose of the study, what participation entailed, and rights as a participant, verbal informed consent was obtained. Trained research assistants conducted interviews on basic demographic and social information and then verbally administered the HSCL-25, the Medical Outcome Study 36-Item Short-Form Health Survey (SF-36), and a pool of locally derived expressions. The same instruments were performed on 21 consecutive clinic attendees to assess inter-rater reliability, and 12 were re-interviewed a week later for test-retest reliability.

Measures

The Anxiety and Depression Subscales of the HSCL-25 The HSCL-25 (Hesbacher *et al*, 1980) includes the anxiety and depression dimensions of the Symptom Checklist-90 (Derogatis *et al*, 1974), with scores of individual items ranging from one (not bothered) to four (extremely bothered) with a mean of 1.75 conventionally defined as the cut-off point for "caseness" in North American subjects (Winokur *et al*, 1984). The Kiswahili version was translated, back-translated, and refined as described in another article (Lee *et al*, 2008).

The Edinburgh Postnatal Depression Scale (EPDS) was not used, as the purpose was eventually to develop a general depression screen for a wider primary care population. In addition, it was thought to be important to include somatic symptoms in a setting where somatic complaints are the main mode of expression (Ndetei, 1979) and may not differ greatly from non-puerperal depression (Martin *et al*, 1989; Pritchard *et al*, 1996).

Item Pool of Locally Derived Expressions. On the basis of qualitative data from ethnographic interviews, 30 different idioms for depressive and anxiety symptoms were identified and piloted for reliability. They were initially classified into six emotional, five behavioural, and 19 somatic symptoms, as shown in Figure 1, and scored on a scale from one (not bothered) to four (extremely bothered).

The Physical and Mental Health Measures of the SF-36. The SF-36 (Ware & Sherbourne, 1992) consists of eight constructs measuring physical and mental health; on a scale of 0-100, a lower score indicates lower health-related quality of life. The SF-36 has been tested in several different languages and cultures (Aaronson, 1992), including in Kiswahili (Wagner *et al*, 1999), with good reliability and validity (Wyss *et al*, 1999). Redundant dimensions of high correlation (Kaaya *et al*, 2002) were excluded for this study. The SF-36 version used was forward- and back-translated using the International Quality of Life Assessment (IQOLA) method (Ware *et al*, 1996).

Figure 1: Flowchart of DSQ Item Selection

30-Item Pool of Local Expressions	
Emotional	**Behavioural**
Bitterness of the soul	Inability to mix and talk with people
Sadness with a motoric component	Need to force oneself to do chores
Irritability	Excess sleep
Many worries	Strange dreams
Desire to scream	Screaming without awareness of doing so
Feeling confused	Withdrawal beyond the norm
Somatic	
Loss of appetite	Turning inside the head
Feeling of blood not circulating in the body	Dizziness
Blood clotting in the vessels	Vomiting
Feeling tired	Headache
Loss of energy	Ill-ease/fever
Earache	Stomach ache
Chest tightness	Swelling of the eyes
Tightness of the whole body	Heart going fast
Aches in the whole body	
Feeling cold	

↓ **Addition of HSCL-25 Items**

47-Item Pool of Local + Non-Equivalent HSCL Expressions

↓ **Stepwise Logistic Regression**

Final 19-Item DSQ

Statistical analyses

All statistical analyses were performed with SPSS/PC version 9.0. Descriptive analyses for the individual locally derived items were done and tabulated according to frequency of endorsement, as defined by a score greater than one.

Items from the pool of local expressions were then combined with those of the HSCL-25, except for items with semantic or conceptual equivalency and high Pearson correlation. The resulting pool of items was then entered into a forward stepwise logistic regression after dividing the sample into two roughly equal-sized groups. A number of analyses were conducted for validation of the final DSQ. First, descriptive, item-to-scale, and item-to-item correlations were obtained. Secondly, Cronbach's alpha was calculated to evaluate internal consistency. Thirdly, inter-rater and one-week test-retest reliability was estimated using the intra class correlation via one-way analysis of variance. Fourth, a principal components analysis with equamax rotation was employed to draw out subscales and examine dimensions. Fifth, discriminant and criterion validity were estimated through Pearson correlation of the DSQ with the SF-36 dimensions and multiple regression with key socio demo-

graphic predictors. Finally, percentages of score ranges were obtained for comparison between the HSCL-25 and the DSQ outcomes.

RESULTS

The number of participants recruited was 787, whose characteristics are shown in Table 1. All items of the scales were answered with the exception of three for the HSCL-25 and one for the locally derived items, for which list-wise exclusions were made. Descriptive data for both instruments appear in Table 1. An economic satisfaction scale was rated to complement socio demographic data on matters important to women (e.g., ability to buy clothes, ability to cook three meals per day, ability to send children to school, etc.).

Reliability and validity of the HSCL

Validation of the HSCL-25 in a Tanzanian setting (Lee *et al*, 2008) revealed good *internal consistency* (α = 0.90), *inter-rater reliability* (intraclass r = 0.85), *test-retest reliability* (intraclass r = 0.85), *convergent validity* (item-to-subscale coefficients ranging from 0.45 to 0.79), and *discriminant validity* (HSCL-25 to SF-36 coefficients ranging from -0.35 to -0.49).

Table 1: Participant Demographics and HSCL Scores (n = 787)

			Mean	**SD**	**Range**
Age of Participant (years)			24.9	5.7	15-48
Gestational Age of Participant (weeks)			29.1	4.0	17-39
Household Inhabitants per Room			1.23	0.76	0-7
Per Capita Cash for Daily Food (Tanzanian shillings) [1]			314	287	0-5,000
Percentages					
Marital Status		**Education**		**Employment**	
Single	13.7	None	17.0	Self-Employed	19.1
Married	66.0	Less than Grade 7	15.8	Employed	3.4
Other	18.1	Grade 7	60.5	Unemployed	77.5
Separated	1.8	Above Grade 7	50.0		
(Sub) Scale			**% Positives (n)2**	**Mean ± SD**	**Range**
HSCL-10 (Anx.)			50.6 (398)	1.16 ± 0.26	1.00-2.80
HSCL-15 (Dep.)			47.8 (376)	1.15 ± 0.30	1.00-3.80
HSCL-25 (Total)			63.5 (500)	1.15 ± 0.26	1.00-3.24
Economic Satisfaction			2.78 ± 0.53	1.00-4.00	

Key: [1]Approximately 800 Tanzanian shillings = 1 U.S. Dollar; [2]Indicates symptom endorsement at any level of severity

Table 2: Positive Score Frequencies and Means of the DSQ Item Pool (n = 787)

Local Item	HSCL Item	Item Description	% Positive1	Mean ± Standard Deviation
24.		Headache	28	1.37 ± 0.68
26.		Stomachache	27	1.37 ± 0.69
28.		Heart racing	24	1.31 ± 0.63
14.		Feeling tired	22	1.28 ± 0.60
22.		Dizziness	19	1.25 ± 0.58
19.		Aches in the whole body	18	1.22 ± 0.53
15.		Loss of energy	18	1.24 ± 0.58
25.		Ill-ease/fever	15	1.21 ± 0.56
11.		Loss of appetite	14	1.19 ± 0.53
29.		Irritability	14	1.21 ± 0.58
8.		Need to force oneself	12	1.18 ± 0.54
10.		Strange dreams	11	1.16 ± 0.52
7.		Many worries	11	1.14 ± 0.48
21.		Turning inside the head	10	1.14 ± 0.45
9.		Excess sleep	9	1.18 ± 0.54
17.		Chest tightness	8	1.11 ± 0.42
23.		Vomiting	8	1.12 ± 0.44
5.		Withdrawal beyond the norm	7	1.11 ± 0.45
4.		Sadness with a motoric component	7	1.11 ± 0.44
2.		Bitterness of the soul	6	1.09 ± 0.41
6.		Inability to mix and talk with people	5	1.08 ± 0.37
20.		Cold	4	1.07 ± 0.35
30.		Desire to scream	3	1.06 ± 0.35
18.		Tightness of the whole body	3	1.05 ± 0.30
12.		Feeling of blood not circulating in the body	3	1.04 ± 0.24
32.		Feeling confused	2	1.03 ± 0.25
31.		Screaming without awareness of doing so	2	1.04 ± 0.29
16.		Earache	2	1.02 ± 0.21
13.		Blood clotting in the vessels	2	1.02 ± 0.18
27.		Swelling of the eyes	1	1.01 ± 0.10
	14.	Loss of sexual interest or pleasure	26	1.46 ± 0.87
	16.	Difficulty falling asleep or staying asleep	13	1.18 ± 0.51
	4.	Nervousness or shakiness inside	11	1.14 ± 0.44
	18.	Feeling blue	10	1.14 ± 0.47
	1.	Being suddenly scared for no apparent reason	10	1.12 ± 0.41
	13.	Crying easily	9	1.13 ± 0.44
	2.	Feeling fearful	9	1.10 ± 0.36
	23.	Feeling no interest in things	9	1.13 ± 0.47
	10.	Feeling restless, not being able to sit still	8	1.10 ± 0.39
	9.	Spells of terror or panic	7	1.08 ± 0.33
	19.	Feeling lonely	6	1.09 ± 0.40
	6.	Trembling	6	1.07 ± 0.31
	12.	Blaming oneself for things	5	1.07 ± 0.35
	21.	Feeling trapped or caught	5	1.08 ± 0.39
	20.	Thoughts of ending one's life	3	1.04 ± 0.26
	17.	Feeling hopeless about the future	2	1.04 ± 0.27
	25.	Feelings of worthlessness	2	1.03 ± 0.22

Key: [1]Indicates symptom endorsement at any level of severity

Item Pool for the DSQ

The frequencies of positive scores for the locally derived items ranged from 1% to 28% (median = 9%), the first nine of which were all somatic, and are shown in Table 2. These were added to the HSCL-25 to create a pool of items, excluding eight from the HSCL-25 thought to be semantically and conceptually equivalent, and with Pearson coefficients ranging from 0.33 to 0.81 (median 0.64). The resulting 47 items (Table 2) were then prepared for logistic regression analysis.

Development of the DSQ: A cut-off of 1.05 for the 47-item mean scores was used to classify subjects into two roughly equal-sized groups, and subsequent logistic regression reduced the scale to 19 items predicting 97.3% of this classification (Table 3). These 19 items of the final DSQ had item-to-scale correlation coefficients ranging from 0.29 to 0.76. Item-to-item correlations were variable, ranging from -0.01 to 0.52, indicating relative independence of many items. The scores for the 19-item DSQ ranged from 1.00 to 3.00, with a mean of 1.18 and standard deviation of 0.27.

Table 3: Stepwise Forward Logistic Regression Analysis Results (the DSQ)

Step	HSCL Item	Local Item	Item Description	Chi Square
1		24.	Headache	256.1
2		14.	Feeling tired	166.1
3	14.		Loss of sexual interest or pleasure	104.0
4		28.	Heart racing	76.8
5		26.	Stomachache	59.4
6	1.		Being suddenly scared for no reason	48.3
7		19.	Aches in the whole body	43.3
8		31.	Screaming without awareness of doing so	13.9
9		23.	Vomiting	44.4
10		9.	Excess sleep	19.7
11		29.	Irritability	30.6
12		25.	Ill-ease/fever	23.3
13	9.		Spells of terror or panic	18.6
14		21.	Turning inside the head	20.9
15		6.	Inability to mix and talk with people	18.9
16	13.		Crying easily	14.6
17	20.		Thoughts of ending one's life	5.6
18		22.	Dizziness	16.5
19	25.		Feelings of worthlessness	0.0

$P < 0.0005$ for all items

Reliability and validity of the DSQ: The internal consistency of the DSQ was high, as estimated by a Cronbach's alpha value of 0.84. Inter-rater reliability revealed an intraclass correlation coefficient of 0.89, while test-retest reliability yielded an intraclass coefficient of 0.82 within a one-week period.

Content validity was established through inspection of the items endorsed as listed in Table 2. The rank order in which they appear come closest to a depression-related disorder, whereby the first 11 include feeling tired, loss of energy, loss of appetite, and need to force oneself, in addition to somatic symptoms commonly associated with depression (cranial, gastrointestinal, cardiac, and pain).

Construct validity was established as the locally derived items clustered according to the expected behaviour of depression and anxiety. As postulated, the items converged well on principal components analysis with loadings of 0.24 or more in the first component before rotation, indicating the measurement of a single construct. A rotated analysis resulted in five orthogonal dimensions with Kaiser's criterion of eigenvalues greater than one: (i) symptoms of social withdrawal (factor loading 12.6% of variance); (ii) symptoms of confusion (loading 11.9%); (iii) somatic symptoms (loading 10.8%); (iv) anxiety symptoms (loading 10.3%); and (v) symptoms of fatigue (loading 9.4%). Altogether, these dimensions accounted for 55.0% of the total variance.

Further assessment of construct validity was done through examining discriminant and criterion validity. The Pearson coefficients with the SF-36, ranging from -0.57 to -0.37, supported the postulation that higher mean scores would correlate negatively with perceptions of health as reflected in the SF-36 scores. Criterion validation was estimated using multiple regression analysis, from which satisfaction with economic provisions, control over decisions on household matters, marital status, and education emerged as significant predictors (β range -0.21 to 0.09; $P < 0.05$) for a low DSQ score. Employment status, per capita cash for food, age, and inhabitants per room, on the other hand, did not emerge as significant predictors (β range -0.07 to 0.04; P range 0.08 to 0.56).

Finally, percentages of score ranges were obtained for the HSCL-25 and the DSQ. While rates of DSQ endorsement did not improve drastically with the use of locally derived expressions (64.4%, as compared to 63.5% for the HSCL-25), the reporting of greater severity increased significantly, raising scores of 1.40 or higher to 15.0%, as compared to 10.8% on the HSCL-25.

DISCUSSION

Recognising that mental disorders have complex and multi-factorial aetiologies, social and ethnographic contexts become an important consideration. Rapid social and environmental changes (Harpham, 1994) as well as violence and trauma par-

ticularly contribute to depression among those who are relatively powerless with few resources (Desjarlais *et al*, 1995; Patel *et al*, 1999; McCauley *et al*, 1998), which include women. Postnatal depressive illnesses are especially neglected, with serious and common consequences that affect the entire family unit (O'Hara & Swain, 1996). The *World Bank Development Report* (1993) declared depression as the fifth priority for women for health intervention. A simple screen for the poorly recognized debilitation of depression and anxiety can be particularly helpful in a setting where resources for training are scarce and the prevalence of ailment high. This study made an attempt to show that such an instrument can be developed, starting with target populations such as women, who are highly exposed to socioeconomic disadvantages and other risk factors for depression and yet represent a major portion of the population. Because suicide is uncommon in the region, suffering may be severe, and the cost of under recognition great; in Wyss *et al*. (1999) women had significantly lower mean SF-36 scale scores than men on all scales. This implies lower performance and has implications for the family, a unit highly reliant on the woman in stressful situations. While healthcare for women is undervalued, their routine presentation for pregnancy booking allows for contact, and hence provided the setting for this study.

A previous article (Lee *et al*, 2008), which revealed low severity detection rates of depression with the HSCL-25, postulated that items alluding to the same affective state may not trigger an affirmative response because of their differences in expression. Manson (1995) notes, diagnostic criteria that depend largely on "eliciting ego-oriented, context-less self-statements of dysphoria may be constrained, intrinsically, from discovering other ways of feeling and expressing the same affect." Swantz (1989) observed that for the Dar es Salaam population, the closer questions became to personal experiences, the less accurate were the answers. Moreover, perinatal rituals and taboos are less common in Western societies (Cox, 1996), and their preclusion may leave out important social influences on perinatal mental health.

Consideration of both etic (emphasizing the universal elements of illness across cultures) and emic (emphasizing the unique socio-cultural contributions to illness manifestations) perspectives, and hence combining objective and subjective approaches, is important in instrument development. The need to incorporate culturally indigenous expressions becomes all the more pronounced in depression, where meanings brought to the context largely shape the psyche and its experiences. For instance, bodily complaints predominate in depressive and anxiety disorders among members of non-Western societies (Leff, 1981; Kirmayer, 1989), and the sample of this study accorded with this prediction. Of the nine primarily endorsed somatic symptoms (Table 2), only three are represented in the HSCL-25, and two in the Diagnostic and Statistical Manual (DSM).

From the general pattern of symptom endorsement, one might conclude that depression in this setting differs not so much in symptom constellation but in priori-

ties given to them. Most striking is the failure of depressed affect to emerge as an important discriminating feature in the logistic regression. According to the principal components analysis, a combination of irritability and social withdrawal explains most of the variance. Does the concept of depressive disorder, then, apply in the Tanzanian setting, despite the absence of a reported depressed mood? The fact that eight (headache*;* feeling tired*;* loss of sexual interest or pleasure*;* excess sleep*;* inability to mix and talk with people*;* crying easily; thoughts of ending one's life; feelings of worthlessness) of the 19 DSQ items clearly point to a depressive disorder as we know it would support this view. Additionally, of the remaining items, four (heart racing; being suddenly scared for no reason; spells of terror or panic; dizziness) are anxiety symptoms and six (stomach ache; aches in the whole body; screaming without awareness of doing so; irritability; ill-ease/fever; turning inside the head) arguably indicators of stress, both conditions of which are associated with depression. Makanjuola and Olaifa (1987) found that Nigerian patients presenting with somatic symptoms but without mood disorder responded to treatment with antidepressants. The word "depressed" is altogether absent in some cultures, and yet this absence is perceived not to preclude the existence of an analogous affect (Manson, 1996). Furthermore, depressive disorder is often found to manifest with complaints of irritability (as in children, who are more prone to alexithymia), joylessness, or numbness of affect.

Among the DSM criteria for depression, appetite disturbance and concentration difficulties did not appear at all in the DSQ, suggesting that these features may be more pertinent in settings where food scarcity is rare and performance of high concentration paramount. Meanwhile, loss of libido emerged as a prominent discriminant in the local sample, which alludes to the centrality of sexual functioning and fertility in Tanzanian culture. Other common features in this setting associated with depression that have not managed to enter normative level, include somatic symptoms and experiences of frustration or confusion. Both are associated with lower levels of verbalization of depressed affect, as perhaps is the desire to scream in a context where misery without explanation is not acknowledged.

In factor analysis, the addition of locally derived expressions and the elimination of other items allowed for much cleaner results, compared to those of the HSCL-25 (Lee *et al*, 2008). While the DSQ materialized the same number of dimensions, they were qualitatively far more salient: social withdrawal, confusion, somatic symptoms, anxiety symptoms, and fatigue. Symptoms of social withdrawal, explaining the largest proportion of variance, emerged prominently, highlighting the importance of social involvement in the African setting and its potential sensitivity as a screening element for disorders. Subjective feelings of confusion and somatic symptoms also factored in prominently, alluding to greater experiences of suffering than the subject is willing or ready to articulate.

Multiple regression analysis revealed socio-demographic predictors in accordance with expectation in terms of economic status, control over household decisions, and marital status. The economic satisfaction scale results reflected the high association of common mental disorders with poverty and lower standards of living, as is well recorded (Lewis *et al*, 1998; Weich & Lewis, 1998). Employment status approached significance in the direction suspected (i.e., holding a job brings ostracism in a group-oriented society that expects one to be home-bound), while being single, or at least legally and non-polygamous married, proved protective against depression. Education, interestingly, was a positive predictor for high DSQ scores, which raised several possible reasons: social isolation in an environment where few women are highly educated; discrepancy between job status and education due to economic discrimination; and role conflict and overload (Gove W, Tudor, 1972; Schwartz, 1991). Age did not show significance in the linear regression model, but a plot of results revealed bimodal distribution as expected in a relatively young, child-bearing age group.

Finally, while rates of DSQ endorsement did not improve drastically with the use of locally derived expressions (64.4%, as compared to 63.5% for the HSCL-25), the reporting of greater severity increased significantly, raising scores of 1.40 or higher to 15.0%, as compared to 10.8% on the HSCL-25. This gain was lost in raising the cut-off point to 1.75 or above (4.1% and 4.2% for the HSCL-25 and the DSQ, respectively), arguing for the utility of a lower cut-off point. These findings accorded with the conjecture that greater weight needs to be given to symptom endorsements in a setting where social sanctions against emotive expression are high. Further calibration for caseness was beyond the scope of this paper and is discussed in another article (Kaaya *et al*, 2002).

This study raised many more relevant and important issues, but the scope of the paper limited their undertaking. While deemed appropriate as a starting point, there are major limitations to the use of an antenatal population for guiding general studies, as noted elsewhere (Lee *et al*, 2008). Further research is needed to establish the applicability, if any, of the obtained results to the general population. Another major limitation is the use of logistic regression, in the absence of a gold standard measurement that might allow for a receiver operating characteristic analysis. However, this was intentional, with plans to apply the knowledge gained from this internal analysis to diagnostic interviews of the general population, which will yield a comparison of DSQ results with clinical judgment. The issue thus points to the general difficulties of establishing a valid psychiatric instrument. Psychiatry brings with it a culture, institutional epistemologies, and attitudes toward illness and suffering. While openness to local explanatory models and expressions is intended to counteract some of these effects, that the very lens through which we make our observations is heavily affected by our training is unavoidable. These issues inevitably applied to this paper, which purports to be not an endpoint but a beginning,

whence we can hope to gradually improve our understanding of psychopathology through examination from different angles.

CONCLUSION

Depression is an illness that afflicts women and other socially or globally disadvantaged groups. While these groups are at greater risk for impairment and suffering, they are generally underrepresented in clinic and hospital populations, and studies with a focus on these target groups are urgently needed. As knowledge of illness manifestations in such groups is lacking, their examination can improve etic and emic understandings of psychopathology in general and help meet the needs of local populations in particular. The DSQ, designed to integrate these perspectives, was established as a reliable and valid measure of depression and anxiety in a Tanzanian primary care clinic population. Suggestions can be made for the potential application of the measure in clinical and epidemiological research, including evidence-based interventions that incorporate the use of screening instruments.

Acknowledgement

Authors thank study participants and research assistants, particularly Ms. Getrude Kessy who coordinated field work. Institutional support from the Muhimbili University and funding support from the Canadian International Development and Research Council made this study possible.

REFERENCES

Aaronson, N.K., Acquadro, C., Alonso, J., *et al* (1992) International Quality of Life Assessment (IQOLA) project. Quality of Life Research, 1, 349-351.

Abas, M.A. & Broadhead, J.C. (1997) Depression and anxiety among women in an urban setting in Zimbabwe. Psychological Medicine, 27, 59-71.

Cox, J.L. (1996) Perinatal mental disorder: A cultural approach. International Review of Psychiatry, 8, 9-16.

Derogatis, L.R., Lipman, R.S., Rickels, K., *et al* (1974) The Hopkins Symptom Checklist (HSCL): A self-report symptom inventory. Behavioural Science, 19, 1-15.

Desjarlais, R., Eisenberg, L., Good, B., *et al* (1995) World Mental Health: Problems and Priorities in Low-Income Countries. New York: Oxford University Press.

German, G.A. (1987) Mental health in Africa: II. The nature of mental disorder in Africa today: Some clinical observations. British Journal of Psychiatry, 151, 440-446.

Gove, W., Tudor, J. (1972) Adult sex roles and mental illness. American Journal of Sociology, 78, 812-835.

Harpham, T. (1994) Urbanization and mental health in developing countries: A research role for social scientists, public health professionals and social psychiatrists. Social Science and Medicine, 39, 233-245.

Hesbacher, P.T., Rickels, K., Morris, R.J., *et al* (1980) Psychiatric illness in family practice. Journal of Clinical Psychiatry, 41, 6-10.

Hinton, W.L., Du, N., Chen, Y.C., *et al* (1994) Screening for major depression in Vietnamese refugees: a validation and comparison of two instruments in a health screening population. Journal of General Internal Medicine, 9, 202-6.

Kaaya, S.F., Fawzi, M.C.S., Mbwambo, J.K., Lee, B., Msamanga, G.I. & Fawzi, W. (2002) Validity of the Hopkins Symptom Checklist-25 amongst HIV-positive pregnant women in Tanzania. Acta Psychiatrica Scandinavica, 106, 9-19.

Kirmayer, L.J. (1989) Cultural variations in the response to psychiatric disorders and emotional distress. Social Science and Medicine, 29, 327-339.

Kleinman, A. (1977) Depression, somatisation, and the "new cross-cultural psychiatry." Social Science and Medicine, 11, 3-9.

Lee, B., Kaaya, S.F., Mbwambo JK, Smith-Fawzi MC, Leshabari MT (2008) Detecting depressive disorder with the Hopkins Symptom Checklist-25 in Tanzania. International Journal of Social Psychiatry 54(1): 7-20

Leff, J. (1981) Psychiatry around the Globe. New York: Marcel Dekker.

Lewis, G., Bebbington, P., Brugha, T.S., *et al* (1998) Socio-economic status, standard of living and neurotic disorder. Lancet, 317, 115-119.

Makanjuola, J.D.A. & Olaifa, E.A. (1987) Masked depression in Nigerians treated at the Neuro-Psychiatric Hospital at Aro, Abeokuta. Acta Psychiatrica Scandinavica, 76, 480-485.

Manson, S.M. (1996) Culture and DSM-IV: Implications for the Diagnosis of Mood and Anxiety Disorders. In Culture and Psychiatric Diagnosis: A DSM-IV Perspective (eds. J.E. Mezzich, A. Kleinman, H. Fabrega, *et al*), pp.99-113. Washington, DC: American Psychiatric Press, Inc.

Manson, S.M. (1995) Culture and major depression: Current challenges in the diagnosis of mood disorders. Psychiatric Clinics of North America, 3, 487-501.

Marsella, A.J. (1978) Thoughts on cross-cultural studies on the epidemiology of depression. Cultural Medicine and Psychiatry, 2, 343-357.

Martin, C.J., Brown, G.W., Goldberg, D.P., *et al* (1989) Psycho-social stress and puerperal depression. Journal of Affective Disorders, 16, 283-293.

McCauley, J., Kern, D.E., Kolodner, K., *et al* (1998) Relation of low-severity violence to women's health. Journal of General Internal Medicine, 13, 687-691.

McKelvey, R.S., Webb, J.A. (1997) A prospective study of psychological distress related to refugee camp experience. Australian and New Zealand Journal of Psychiatry, 31, 549-54.

Mollica, R.F., Wyshak, G., De Marneffe, D., *et al* (1987) Indochinese version of the Hopkins Symptom Checklist-25: A screening instrument for psychiatric care of refugees. American Journal of Psychiatry, 144, 497-500.

Ndetei, D.M. (1979) The prevalence and clinical presentation of psychiatric illness in a rural setting in Kenya. British Journal of Psychiatry, 135, 269-72.

O'Hara, M. & Swain, A. (1996) Rates and risk of postpartum depression: A meta-analysis. International Review of Psychiatry, 8, 37-54.

Patel, V., Araya, R., De Lima, M., *et al*. (1999) Women, poverty and common mental disorders in four restructuring societies. Social Science and Medicine, 49, 1461-1471.

Patel, V. & Winston, M. (1994) The universality of mental illness revisited: assumptions, artefacts and new directions. British Journal of Psychiatry, 165, 437-440.

Patel, V., Gwanzura, F., Simunyu, *et al* (1995) The explanatory models and phenomenology of common mental disorder in Harare, Zimbabwe. Psychological Medicine, 25, 1191-1199.

Prince, R. (1968) The changing picture of depressive syndromes in Africa: Is it fact or diagnostic fashion? Canadian Journal of African Studies, 1, 177-192.

Pritchard, D.B. & Harris, B. (1996) Aspects of perinatal psychiatric illness. British Journal of Psychiatry, 169, 555-562.

Rwegellera, G.G.C. (1981) Cultural aspects of depressive illness: Clinical aspects and psychopathology. Psychopathologie Africaine, 17, 41-63.

Schwartz, S. (1991) Women and Depression: A Durkheimian Perspective. Social Science and Medicine, 32, 127-140.

Swantz, M.-L. (1989) Manipulation of multiple health systems in the coastal regions of Tanzania. In Culture, Experience and Pluralism: Essays on African Ideas of Illness and Healing, Uppsala Studies in Cultural Anthropology, vol. 13 (eds. A. Jacobson-Widding & D. Westerlund), pp.277-287. Stockholm: Academiae Upsaliensis.

Üstün, T.B., Goldberg, D., Cooper, J., *et al* (1995) New classification for mental disorders with management guidelines for use in primary care: ICD-10 PHC chapter five. British Journal of General Practice, 45, 211-215.

Wagner, A.K., Wyss, K., Gandek, B., *et al* (1999) A Kiswahili version of the SF-36 Health Survey for use in Tanzania: translation and tests of scaling assumptions. Quality of Life Research, 8, 101-110.

Ware, J.E., Gandek, B.L., Keller, S.D., *et al* (1996) Evaluating instruments used cross-nationally: Methods from the IQOLA Project. In Quality of Life and Pharmacoeconomics in Clinical Trials (ed. B. Spiker). Philadelphia: Lippincott-Raven Publishers.

Ware, J.E. & Sherbourne, C.D. (1992) The MOS 36-Item Short-Form Health Survey (SF-36): I. Conceptual framework and item selection. Medical Care, 30, 473-483.

Weich, S. & Lewis, G. (1998) Poverty, unemployment and the common mental disorders: A population-based cohort study. British Medical Journal, 317, 226-230.

Weiss, M.G. & Kleinman, A. (1988) Depression in cross-cultural perspective: Developing a culturally informed model. In Health and Cross-Cultural Psychology (eds. P.R. Dasen, J.W. Berry & N. Sartorius). Newbury Park, CA: Sage Publications.

Whyte, S.R. (1991) Attitudes towards mental health problems in Tanzania. Acta Psychiatrica Scandinavica Suppl. 364, 59-76.

Winokur, A., Winokur, D.F., Rickels, K., *et al*. (1984) Symptoms of emotional stress in a family planning service: Stability over a four-week period. British Journal of Psychiatry, 144, 395-399.

World Bank (1993) World Development Report 1993: Investing in Health. New York: Oxford University Press.

World Health Organization (1986) Problem of Mental Health in the African Region: Report of a Roundtable. Brazzaville: WHO Regional Office for Africa.

Wyss, K., Wagner, A.K., Whiting, D., *et al* (1999) Validation of the Kiswahili version of the SF-36 Health Survey in a representative sample of an urban population in Tanzania. Quality of Life Research, 8, 111-120.

Chapter Four

The Kiswahili Version of the Hopkins Symptom Checklist – 25: Validity and Calibration amongst HIV- positive Antenatal Clinic Attendees in Dar es Salaam, Tanzania

Manuscript published as: Kaaya SF., Smith Fawzi MC, Mbwambo JK., Lee B., Msamanga GI., Fawzi W. (2002) The Kiswahili version of the Hopkins Symptom Checklist – 25: Validity and calibration amongst HIV-positive antenatal clinic attendees in Dar es Salaam, Tanzania. *Acta Psychiatrica Scandinavica,* 106 (1):9-19

ABSTRACT

The objective was to validate the Hopkins Symptom Checklist-25 (HSCL-25) for use as a depression screen amongst HIV positive pregnant women. Amongst 903 (mean age 24.8 years) HIV-positive pregnant women, a two-phased design included measures for health-related quality of life, perceived social support, and the HSCL-25 screen for depressive (HSCL-15 subscale) and anxiety symptoms. The Structured Clinical Interview for DSM-IV (SCID) was independently administered on a stratified random sub-sample. The results showed internal consistency of the HSCL-25 (alpha 0.93) and HSCL-15 (alpha 0.9) was adequate, with expected findings demonstrated in discriminant validity analysis. A depression-anxiety construct explained nearly 40% of the variance. Eight individual HSCL-25 items demonstrated an area under the curve (AUC) greater than 0.6 for DSM-IV major depression and the HSCL-25 and HSCL-revised had an optimal depression cut-off score of 1.06 and 1.03 for the HSCL-15. The HSCL-25 demonstrated utility as a screen for depression; its inability to gauge severity of symptoms in this cultural context is discussed.

INTRODUCTION

Human immune-deficiency virus (HIV) infection is chiefly a heterosexually transmitted disease, with the greatest burden falling on sub-Saharan Africa, accounting for over 70% of individuals living with HIV and AIDS globally(UNAIDS, 2000). Its ramifications for mental health include substantial disability from depressive disorder, to which socio-economically disadvantaged groups such as women are particularly vulnerable (Patel *et al*., 1999; Dennerstein, 1993),. Yet most studies on depression and HIV infection have been conducted in Western countries (Cochran & Mays, 1994; Perkins *et al*., 1994; Ostrow *et al*., 1989), on samples of well educated and gainfully employed mostly white homosexual men. Studies incorporating the use of structured and operational diagnostic criteria are almost all carried out in the United States (Rabkin *et al*., 1997; Williams *et al*., 1991; Perry *et al*., 1990; Atkinson *et al*., 1988), and very few have been conducted among HIV-positive women (Brown & Rundell, 1990).

Depression may influence manifestations of HIV infection, through interference with motivation to obtain good medical care (Katon & Sullivan, 1990) as well as its associated immune dysfunction (Reichlin *et al*., 1993; Kessler *et al*., 1991; Evans *et al*., 1989). There are, however, conflicting data regarding the contribution of depression to the course of HIV infection (Lyketsos *et al*., 1996; Burrack *et al*., 1993),, and the very nature of the association between HIV and depression has been questioned (Atkinson *et al*., 1997). Studies done outside of the West (Fukunishi *et al*., 1997; Sebit *et al*., 1995; Maj *et al*., 1994) or with minority groups (Kaplan *et al*.,

1997; McClure *et al*., 1996; Belkin *et al*., 1992), suggest stronger associations between HIV and depression. Being female may confer enhanced risk for more rapid progression of HIV infection irrespective of reproductive status (Koonin *et al*., 1989; Selwyn *et al*., 1989),; survival among men is 14% longer than survival among women at the same stage of illness (Rothenberg *et al*., 1987), and HIV-positive women experience more distress than men, even within a monogamous relationship (Kennedy *et al*., 1995). The limited information on depression amongst pregnant women in the sub-Saharan African context, reveals about 24% of psychiatric morbidity, largely due to depressive symptomatology (Assael *et al*., 1972), the rate being about 10% when one focuses on depression alone (Cox, 1979).

Before approaching the subjects of associations and prevalence of depression, we must examine the problem of diagnostic methods and the utility of screening instruments. There are indications that standardized instruments vary in their intrinsic performance both across different population groups and cultures. These variations may be in part due to cultural differences, for example, a greater tendency to report psychological distress in somatised form in primary care settings has been reported in both Western and non-Western settings (Penayo *et al*., 1990; Katon & Walker, 1998; Cherian *et al*., 1998; Bhat *et al*., 1989; Sen, 1987),,,,. While teasing out physiological versus psychosocial causes for symptoms can be particularly complex in HIV-positive populations (Kalichman *et al*., 1995; Drebing *et al*., 1994; Bornstein *et al*., 1993), stronger associations of symptoms with depression have implications for the clinical management of persons with HIV infection (O'Dell *et al*., 1996; Perkins *et al*., 1995). Studies exploring how a given population understands mental illness and what indigenous expressions and classifications they use can complement epidemiological investigations (Kirmayer *et al*., 1989; Kleinman *et al*., 1977). Additionally, the validity of any psychiatric instrument will depend on calibration for the population under study (Geisinger, 1994). Cut-off points for "caseness" without re-norming can result in inaccurate estimates since scores that are numerically identical can have psychologically different meanings across cultures (van de Vijver & Poortinga, 1997) ,. The premise of this study illustrated by these analyses was that a simple screening tool can be helpful in detecting depression in a setting where resources for training are scarce and the prevalence of disease is high. While access to healthcare for women in developing countries is often limited, their routine presentation for prenatal care allows for consistent contact in the Tanzanian setting, and hence this population was targeted. This article provides analysis of data to validate and calibrate the Hopkins Symptom Checklist-25 (HSCL-25), for use amongst HIV-positive pregnant women in the primary care setting in Tanzania.

MATERIALS AND METHODS

The sample: Between April 1995 and July 1997, 1078 HIV-positive pregnant women attending antenatal clinics in Dar es Salaam (Muhimbili, Mwananyamala, Temeke, Ilala and Mwenge Hospitals) were enrolled in a randomized controlled trial examining the effect of vitamin supplementation on perinatal transmission and progression of HIV. Resident women, with less than 27 weeks gestation (from the last menstrual period) who intended to stay in Dar es Salaam, were eligible to participate in the study. Fawzi *et al* (1999) provide information on the study design and methods in greater detail. The data used for this analysis are derived from 903 women with completed initial psychosocial information prior to delivery. Post-delivery data were excluded from these analyses to avoid confounding due to the likelihood of higher symptoms of psychological distress during the postpartum period.

A stratified random sample was selected for participation in a validation sub-study based on Hopkins Symptom Checklist-25 scores three months after enrolment. The first 50 women who had scored at first psychosocial assessment above the cut-off score of 1.75 for "caseness"[48] on the depression sub-scale were recruited for a Structured Clinical Interview for the DSM-IV diagnosis (SCID). During the same time period of recruitment a random sample of 50 women who had scored on or below the cut-off score of 1.75 were also asked to complete the SCID for the validation study.

Instruments: Socio-demographic and other background information were collected at baseline and psychosocial information at three months after baseline, two months after delivery, and every six months thereafter.

The *psychosocial instrument* comprised three scales. The HSCL-25 is a widely used screening measure that includes symptoms of anxiety (10 items) and depression (15 items) derived from the 90-item Symptom Checklist (SCL-90) (Derogatis *et al*., 1973 & 1974; Parloff *et al*., 1954). The 25-item version (HSCL-25), is scored on a severity scale from "1" (not at all) to "4" (extremely), and has demonstrated its usefulness as a screening tool in various cross-cultural settings (Hinton *et al*., 1994; McKelvey *et al*., 1994; Mollica *et al*., 1987), primary care settings (Hansson *et al*., 1994; Hesbacher *et al*., 1980), and in family planning clients (Winokur *et al*., 1984). In refugee populations sensitivity and specificity for detection of DSM III major depression were estimated as 88% and 73%, based on a cut-off score of 1.75 for "caseness" (Hinton *et al*., 1994). The Medical Outcomes Study Short Form-36 (SF-36) measured health-related quality of life on eight dimensions and has been shown to predict health outcomes over a period of time for a number of different clinical conditions. The SF-36 has been widely used in different cultural settings and has demonstrated good validity and reliability in different languages (Sullivan *et al*., 1995; Bullinger *et al*., 1995). The Kiswahili version of the SF-36 used in Dar es Salaam, Tanzania, revealed good internal consistency (Cronbach's alpha ranging from

0.7-0.92; median 0.81) (Wagner *et al*., 1999), and expected variations in mean scores on its scales by age, gender, education level, socio-economic status and perceived morbidity and disability (Wyss *et al*., 1999).

A 10-item perceived social support scale was derived from a questionnaire, designed "to measure functional elements of social support of patients in a primary care setting" (Broadhead *et al*., 1988). Items were selected to reflect emotional/affective support (I get/have: visits from friends and relatives; useful advice about important things in my life; chances to talk to someone about problems at work or with my housework; chances to talk to someone I trust about my personal and family problems; people who care what happens to me; and love and affection) and material/instrumental support (I get/have: help around the house; help with money in an emergency; help when I need transportation; and help when I am sick). Overall test-retest reliability for the original scale was reported as .66 (Broadhead *et al*., 1988). However, this calculation excluded the items "help with transportation" and "help with money". These two items were retained in this study given their importance in this context.

The Structured Clinical Interview for the DSM-IV (SCID) is a semi-structured interview schedule with modules that reflect DSM-IV defined disorders. It closely mirrors the clinical diagnostic process that is employed by trained clinicians (Spitzer *et al*., 1992) and has demonstrated its validity and reliability among English speaking populations (Riskind *et al*., 1987). Symptoms are rated in a format that allows for rephrasing and asking additional clarifying questions, an aspect that affords helpful flexibility when its use is transferred to a cultural context that differs from its source. The SCID modules used represent common mental disorders at primary care levels and include those for major depressive disorder, generalized anxiety disorder, mixed anxiety depressive disorder, and somatisation disorder. The modules elicited reports on lifetime prevalence of DSM-IV disorders, as well as one-year and one-month prevalence; one-month prevalence data are used in these analyses (First *et al*., 1995).

Instrument translation: The instruments were translated to Kiswahili and back translated to English by separate groups of translators and discrepancies between the various translations were subjected to a panel discussion of indigenous translators that included three psychiatrists with clinical experience in Dar es Salaam. Each item was examined to ensure face validity and a transfer of conceptual meaning in the Kiswahili versions. Final changes to the Kiswahili versions were made after piloting amongst antenatal clinic attendees prior to onset of the study to ensure that the idioms used would be understood by the study population.

Minor modifications of the physical functioning sub-scale of the Sf-36 were made to accommodate the context of the study setting. For example, in the second item of the physical functioning scale reflecting moderate activities, the original version of the SF-36 that included "moving a table, pushing a vacuum cleaner, bowl-

ing, or playing golf" was changed to include more contextual activities such as "drawing water, washing clothes, and carrying a baby." In addition, "climbing several flights of stairs," was changed to "walking up a steep hill" given the limited opportunities for stair climbing in Dar es Salaam.

Data collection procedures: Institutional review boards of the Muhimbili University College of Health and Allied Sciences and the Harvard School of Public Health, provided ethical clearance. Research assistants at the study sites collected the psychosocial information using face-to-face administration, as some of the study participants were illiterate. The SCID was administered within two weeks of administration of the HSCL-25 by two indigenous psychiatrists who were blind to the HSCL-25 scores.

Statistical analysis: A summary description of socio-demographic characteristics of the sample and sub-sample, means and standard deviations (SD) of endorsed items on the HSCL-25 is provided. Internal consistency reliability of items on the HSCL-25, as well as the depression and anxiety sub-scales, was estimated by calculating Cronbach's α. In addition to ensuring careful transfer of items that measured the constructs of general psychological distress and depression, factor analysis of the HSCL-25 and HSCL-15 with varimax rotation was conducted to further assess construct validity. Initial discriminant validity was assessed by establishing Pearson's correlations for single items with overall sum scores of the HSCL-25 and 15. Further a priori assumption was made that persons with high score on the HSCL-25 would report lower score on quality of life indicators and perceived social support as measured by the SF-36 and the perceived social support scale, respectively. Criterion validity was determined using receiver operating characteristic (ROC) analysis. DSM IV criteria for probable depression was utilized as a "gold standard" to estimate the area under the curve for all possible cut-off points on individual items of the HSCL in order to generate symptoms that would be most predictive of major depressive disorder. Finally using receiver operating characteristic (ROC) analysis, the specificity and sensitivity of the HSCL-25, the depression sub-scale (HSCL-15) and a modified version of the HSCL (HSCL-revised) that included the most predictive items are estimated in order to calibrate the scales. The HSCL-revised sub-scale was developed through preliminary use of ROC analysis. The area under the curve (AUC) was calculated for each individual symptom on the HSCL-25, using DSM-IV criteria for major depression as the "gold standard". Items that yielded the highest AUCs were considered to be the most predictive of major depression and were included in a sub-scale of eight symptoms that reflected depression and anxiety.

RESULTS

Socio-demographic information: The sample was comprised of relatively young women of mean age 24.8 years with minimal exposure to formal education, most having completed various stages of primary school education (seven years in Tanzania). The mean gestational age of the sample was 18 weeks, with an average household size of 3.6 persons and a per capita daily expenditure on food of less than a dollar (USD approx: 800 Tanzanian shillings). More than half of the women were married in monogamous partnerships and just over one in ten were single, separated or divorced. The partners of married or cohabiting women had a relatively higher mean age (32.9±4 years) and greater exposure to post-primary education (see Table 1).

Table 1: Socio-demographic characteristics of 903 HIV-positive antenatal clinic attendees, Dar es Salaam, Tanzania

Socio-demographics	**n or means's (N=903)**	**%**
Women's age (range 19-40 years):	24.8±4.8	-
15-24	471	52.2
25-29	279	30.9
30+	153	16.9
Women's education level		
Primary school	743	82.3
Post-primary education	88	9.7
Nil or adult education	72	8.0
Mean number of household members	3.6±2.0	-
Mean daily per-capita expenditure on food (TShs)[1]	529±275.6	-
Mean gestational age (range 8-26 weeks)	18.0±3.2	-
Marital status		
Married monogamous	533	59.0
Cohabiting	222	24.6
Single/divorced/separated	97	10.7
Married polygamous	51	5.6
Mean number of years married/cohabiting (n=814)	3.5±4.0	-
Spouse/partner's mean age (n=815, range 19-56 years)	32.9±6.6	-
Did not know age	88	9.7
Spouse/partner's education level (n=813)		
Nil or adult education	17	1.9
Primary school	519	57.5
Post-primary education	207	22.9
Did not know	70	7.8

[1] USD = approximately 800 Tanzanian Shillings (TShs)

Psychometric properties of the HSCL-25: Endorsement of items on the HSCL-25 at any level of severity in the sample ranged from 2% to 26%. The most frequently endorsed items were low mood and loss of sexual interest or pleasure, reported by

more than a fifth of the women followed by worrying too much about things, headaches, feeling trapped, and a series of physiological disturbance items as noted in Table 2.

Table 2: Endorsement frequency and mean scores of the HSCL-25 and correlations between the HSCL sum scores and its individual items in 903 HIV-positive antenatal clinic attendees, Dar es Salaam, Tanzania.

Scales	Frequency endorsed [2] (%)	Mean score and SD	Pearson's correlations [3]
HSCL-25 items (Cronbach's alpha 0.93)[1]			
Feeling blue	26.0	1.23 ± 0.59	.77 (.80)
Loss of sexual interest or pleasure	23.0	1.41 ± 0.86	.52 (.56)
Headaches	18.0	1.25 ± 0.59	.47 (.38)
Worrying too much about things	18.0	1.28 ± 0.68	.71 (.75)
Feeling trapped or caught	17.0	1.26 ± 0.65	.66 (.72)
Difficulty falling sleep or staying asleep	16.0	1.21 ± 0.60	.52 (.52)
Feeling low in energy, slowed down	15.0	1.20 ± 0.53	.68(.68)
Blaming oneself for things	14.0	1.20 ± 0.54	.70 (.70)
Poor appetite	11.0	1.15 ± 0.49	.46 (.46)
Heart pounding or racing	10.0	1.30 ± 0.65	.57 (.45)
Feeling everything is an effort	10.0	1.14 ± 0.46	.66 (.66)
Feeling hopeless about the future	10.0	1.15 ± 0.51	.65 (.68)
Feeling fearful	10.0	1.13 ± 0.45	.65 (.51)
Crying easily	10.0	1.14 ± 0.47	.55 (.55)
Spells of terror or panic	9.0	1.12 ± 0.44	.71 (.61)
Feeling no interest in things	9.0	1.12 ± 0.44	.60 (.63)
Faintness, dizziness, or weakness	9.0	1.13 ± 0.46	.54 (.44)
Feeling lonely	9.0	1.12 ± 0.44	.67 (.70)
Being suddenly scared for no reason	8.0	1.11 ± 0.41	.62 (.49)
Feelings of worthlessness	7.0	1.11 ± 0.46	.67 (.72)
Feeling restless, not being able to sit still	6.0	1.08 ± 0.35	.58 (.52)
Thoughts of ending one's life	6.0	1.10 ± 0.40	.57 (.60)
Nervousness or shakiness inside	6.0	1.19 ± 0.52	.67 (.57)
Feeling tense or keyed up	5.0	1.10 ± 0.32	.59 (.50)
Trembling	2.0	1.03 ± 0.24	.40 (.30)

Key: [1] Items are endorsed at any level of severity on the HSCL-25; [2] Higher HSCL scores indicate greater psychological morbidity; [3] Correlations between sum scores of the HSCL 25 and (HSCL-15) and individual HSCL-25 items, all correlation coefficients were significant at p=0.01 level; 2-tailed

The internal consistency of the HSCL-25 was reasonable with an overall Cronbach's alpha of 0.93 and alphas of 0.9 and 0.85 for the depression and anxiety sub-scales respectively. The items of the HSCL-25 were subjected to a principal components

analysis with varimax rotation, retaining factors with an eigenvalues greater than one.

Table 3: Factor structure of the HSCL-25 amongst antenatal clinic attendees screening HIV positive in Dar es Salaam, Tanzania (n=903)

HSCL-25 Item	Loadings
***Factor 1**: Depression-Anxiety; explained 39% of variance (13 items)*	
Feelings of worthlessness	0.77
Feeling hopeless about the future	0.75
Feeling trapped or caught	0.71
Faintness, dizziness, or weakness	0.70
Feeling blue	0.68
Worrying too much about things	0.66
Thoughts of ending one's life	0.65
Feeling lonely	0.63
Blaming oneself for things	0.58
Feeling everything is an effort	0.55
Feeling no interest in things	0.52
Spells of terror or panic	0.40
Crying easily	0.40
***Factor 2**: Anxiety-panic; explained 25% of variance (5 items)*	
Feeling fearful	0.79
Being suddenly scared for no reason	0.71
Spells of terror or panic	0.71
Nervousness or shakiness inside	0.70
Feeling tense or keyed up	0.59
***Factor 3**: Psycho-physiological; explained 18% of variance (6 items)*	
Heart pounding or racing	0.58
Headaches	0.58
Loss of sexual interest or pleasure	0.57
Feeling low in energy, slowed down	0.51
Poor appetite	0.48
Crying easily	0.40
***Factor 4**: Physiological; explained 18% of variance (5 items)*	
Trembling	0.75
Faintness, dizziness, or weakness	0.60
Difficulty falling sleep or staying asleep	0.56
Feeling low in energy, slowed down	0.48
Poor appetite	0.46

A factor loading on items with an absolute value of 0.4 or more was used as sufficient criteria for its inclusion in a scale on both methodological (Bailey, 1982), and substantive grounds, given that the items with factor loadings between 0.4 and 0.5

reflected core physiological symptoms of depression for factors three and four (see Table 3). Thirty-nine percent of the variance in items on the HSCL-25 was explained by a depression-anxiety construct (first factor), while 25% of the variance is accounted for by the second factor and includes items that can be described as a predominantly anxiety construct. The third and fourth factors, which each explain 18% of the variance includes items that can best be described as psycho-physiological and physiological constructs respectively. A similar principal components analysis with varimax rotation was performed on the HSCL-15 depression sub-scale (see Table 4) and demonstrated items that clustered into two factors. The first factor represented predominantly psychological distress (65% of variance explained) while the second more physiological aspects of depression (35% of variance explained).

Table 4: Factor structure of the depression sub-scale (HSCL-15) amongst antenatal clinic attendees screening HIV positive in Dar es Salaam, Tanzania (n=903)

HSCL-15 Items	Loadings
***Factor 1**: Depression psychological, 65% of variance explained*	
Feeling hopeless about the future	0.76
Feelings of worthlessness	0.76
Feeling blue	0.71
Thoughts of ending one's life	0.70
Feeling trapped or caught	0.69
Blaming oneself for things	0.68
Feeling lonely	0.68
Worrying too much about things	0.68
Crying easily	0.53
Feeling everything is an effort	0.52
Feeling no interest in things	0.49
***Factor 2:** Depression psychosomatic; 35% of variance explained*	
Poor appetite	0.77
Feeling low in energy, slowed down	0.70
Difficulty falling sleep or staying asleep	0.62
Loss of sexual interest or pleasure	0.50
Feeling everything is an effort	0.46
Feeling no interest in things	0.43

Discriminant validity: was initially assessed by examining the correlation between individual HSCL-25 and HSCL-15 items to the overall sum scores of these scales (Table 2). Significant correlations are demonstrated between individual HSCL-25 items and the sum scores of the main and subscale. The correlation coefficients for most of the depressive items were slightly higher for the overall HSCL-15 compared to the overall HSCL-25 scores. Correlations between the total HSCL-25 score and the social support and SF-36 dimension scores, summarized in Table 5, supported an a priori

assumption that high scores on the HSCL-25 (more symptomatology) would correlate negatively with perceived health-related quality of life scores (lower perceived health-related quality of life) and positively with social support (lower perceived social support).

Table 5: Endorsement frequency and/or mean scores of SF-36 dimensions and the Social Support Scale and their correlations with HSCL sum scores in 903 HIV-positive antenatal clinic attendees, Dar es Salaam, Tanzania.

Scales	Frequency endorsed (%)	Mean score and SD	Pearson's correlations [3]
Perceived social support (Cronbach's alpha 0.98)[1]	-	1.37 ± 0.60	.27 (0.36)
Get love and affection	85.0	1.41 ± 0.77	–
Get help when sick	85.0	1.23 ± 0.60	–
Visits from relatives and friends	83.0	1.25 ± 0.59	–
Have people who care	83.0	1.43 ± 0.80	–
Useful advice on important things	77.0	1.37 ± 0.77	–
Get help around the house	74.0	1.45 ± 0.84	–
Get financial help in emergency	74.0	1.24 ± 0.62	–
Chance to talk about problems	73.0	1.46 ± 0.85	–
Get help for transport	73.0	1.29 ± 0.70	–
Have a confidant	68.0	1.61 ± 0.99	–
SF-36 dimensions [2]			
Mental health		90.66 ± 16.5	-.80 (-.63)
Vitality		87.97± 18.5	-.64 (-.59)
Social functioning		93.15± 15.5	-.60 (-.51)
General health		79.84± 18.7	-.58 (-.78)
Role emotional functioning		89.85± 26.9	-.51 (-.57)
Bodily pain		85.33± 20.9	-.49 (-.48)
Role physical functioning		86.85± 30.1	-.47 (-.47)
Physical functioning		94.11±11.16	-.40 (-.39)

Key: [1] Items endorsed "as much as I would have liked" on perceived social support scale; Lower mean scores indicate higher perceived social support**;** [2] Higher mean scores indicate greater health-related quality of life; [3] Correlations between sum scores; HSCL 25 and (HSCL-15) SF-36 dimension and perceived social support sum means; All correlation coefficients were significant at 0.01 level; 2-tailed

Criterion validity: Using ROC analysis, and DSM IV criteria for probable and definite major depressive episode as a "gold standard", the area under the curve (AUC) at all possible cut-off points is used to establish items on the HSCL-25 most predictive of a major depressive episode. Eleven women out of 99 who yielded diagnostic information from the SCID met definite criteria for major depressive episode (n=7) (7% one-month prevalence); mixed anxiety and depressive disorder (n=3) (3% one-month prevalence); and generalized anxiety disorder (n=1) (1% one-year prevalence). None

met criteria for somatisation disorder, and two subjects met criteria for probable depressive disorder. On a clinical basis, probable disorder might have been diagnosed as depressive disorder but both subjects did not satisfy the exclusion criteria B.10 on the SCID, related to "symptoms causing significant distress or impairment in social, occupational, or other important areas of functioning". Substitution of roles and responsibilities when a person is ill in a setting where members of the extended family live-in and role definitions are based on age and gender divisions rather than individual responsibilities, might influence one's perception of diminished/impaired functioning in this cultural context. Establishing impairment of functioning from collateral information was not possible in an antenatal clinic setting where relatives do not accompany women.

Figure 1
ROC Curve analysis for the HSCL-25, HSCL-15, and HSCL-revised as screens for Major Depressive Disorder

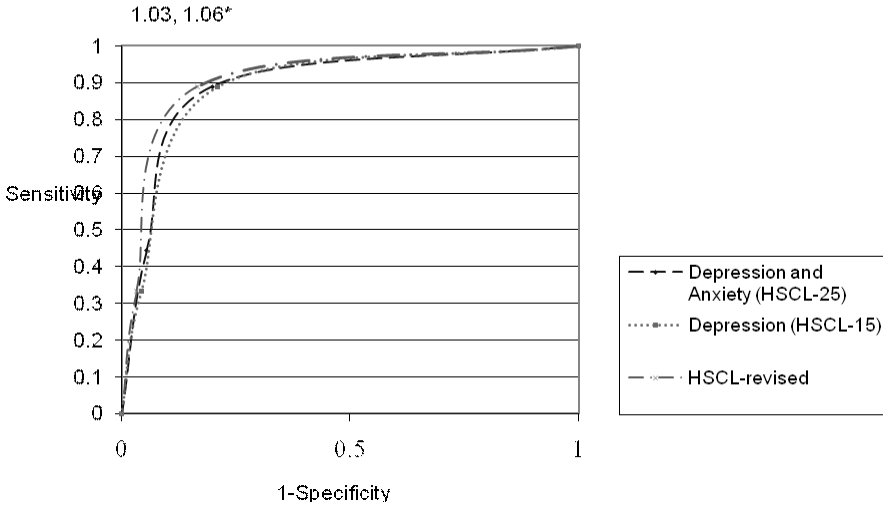

Figure 1: ROC Curve analysis for the HSCL-25, HSCL-15 and HSCL-revised as screens for Major Depressive Disorder.
*Cut-off points for subscales are as follows: HSCL-25: 1.06; HSCL-15: 1.03; and HSCL-revised: 1.06.

ROC analysis of individual HSCL-items revealed AUCs ranging from 0.495 to 0.797. Eight items generated AUC's that were equal to or greater than 0.6, two being items from the anxiety sub-scale and six from the depressive sub-scale, substantiating clinical observations of an overlay of anxiety symptoms in individuals with depressive disorders in this cultural context. The symptoms included "feeling blue" (AUC=.80); "feeling trapped or caught" (AUC=.70); "difficulty falling or staying asleep" (AUC=.70); "worrying too much about things" (AUC=.68); "heart pounding or racing" (AUC=.65); "crying easily" (AUC=.63); "feeling hopeless about the future"

(AUC=.63); and “faintness, dizziness or weakness” (AUC=.61). A modified depression sub-scale (HSCL-revised) was derived from these eight items for screening for depression in antenatal populations and further ROC analysis was conducted to establish cut-off points of the HSCL-25, HSCL-15 and HSCL-revised.

Calibration of the HSCL-25 for caseness in the Tanzanian antenatal primary care context: The ROC curves indicate that the total HSCL-25 and depression sub-scale scores are comparable with respect to their ability to detect major depressive disorder (Figure 1). This is reflected in the similar estimates of the area under the ROC curve (AUC) as follows: for the total HSCL-25 score, the AUC was estimated at .86 (95% confidence interval (CI): .72-.99), while that of the depression sub-scale was also .86 (95%CI: .73-.99). The HSCL-revised demonstrated a slightly higher AUC estimated at .88 (95% CI .75-1.0).

The optimal cut-off points for detecting major depression using the HSCL-25, the HSCL-15 and HSCL-revised sub-scales as screening tests were 1.06, 1.03, and 1.06, respectively. Although the HSCL-25, HSCL-15, and HSCL-revised scales demonstrated the same sensitivity at 89%, the specificity is slightly better for the HSCL-revised (85%), compared with the HSCL-25 (80%) and the HSCL-15 (79%).

Given that this validation study was based on a two-phase design, where the validation sub-sample was drawn from a stratified random sample of the larger cohort, a weighted analysis was also performed in order to account for the different sampling fractions for each strata (Dunn *et al*., 1999). This sensitivity analysis indicated similar findings, whereby the optimal cut-off points for each of these sub-scales remained at 1.03 and 1.06 for the HSCL-15 and the HSCL-revised. Although sensitivity and specificity were attenuated for the weighted analysis of the HSCL-15, 75% and 81%, respectively, results were comparable for the HSCL-revised, with a sensitivity of 88% and a specificity of 89%.

DISCUSSION

In the context of this study, the more important implications of early recognition and hence management of depressive disorders is in improving quality of remaining life (Rabkin *et al*., 1994) and motivation to obtain good medical care. These aspects have important significance on adherence to treatment and for strategies to decrease transmission risks including maternal to child transmission of HIV. In general depressive disorders in primary care settings are often missed (Karlsson *et al*., 2000; Goldberg & Gater, 1996),, recognition rates across 15 sites in a WHO collaborative study ranging from 19.3 to 70% (Ustun & Korff, 1995). The situation in countries such as Tanzania with low human resources for mental health care, and high HIV sero-prevalence informs the need for valid screening instruments for recognition of

depression that can be used by health workers with minimal mental health skills who work with HIV-positive women in antenatal settings.

Studies that aim at validating measures of psychological states are hampered by the lack of a "gold standard" (Nunnally *et al*., 1995; Cochran *et al*., 1994) and though cross-cultural deficiencies in DSM diagnostic criteria have been reported (Maser *et al*., 1991), the SCID provided an appropriate degree of structure and flexibility to accommodate a systematic assessment of major psychiatric disorder. Principal components analysis was used to examine the construct validity; factorial invariance is best understood as an indicator of dimensional constancy across various discrete categories among variables of interest. In this instance, it is evident that a core depression-anxiety construct emerges empirically from the data. All but one (an anxiety and panic construct) of the four constructs emerging from principal components analysis of the HSCL-25, indicating a mixture of somatic and psychological items. This supports previous observations of the absence of a Cartesian mind-body dichotomy in the African cultural context (Lambo, 1964)

A large proportion of this sample of HIV-positive women manifests with a predominantly psychological "core" symptomatology of depression and anxiety, the most frequently endorsed symptoms being "feeling sad" and "loss of sexual interest or pleasure" and "worrying too much about things". Scores for "loss of sexual interest or pleasure" had lower correlations with sum scores on both the HSCL-25 and 15; and a relatively smaller AUC (0.57) on ROC analysis of individual HSCL-items, suggesting conditions other than depression may account for the high endorsement of this symptom. Need for future exploration of possible hypoactive sexual desire disorder, a condition that has been reported as prevalent (20%) amongst HIV-seropositive women elsewhere (Katon *et al*., 1990) is suggested.

The depression sub-scale demonstrated a comparable accuracy to the total HSCL-25 scale in the ROC analysis, suggesting its usefulness for the identification of "probable cases" of clinically significant depression in the primary care settings of this study. However, the abbreviated HSCL-revised in this context provides for not only a more efficient but also a slightly more accurate method of assessment. The lower optimal cut-off score observed in all of the scales (compared with the more universally calibrated cut-off score of 1.75), may reflect difficulty in establishing the conceptual equivalence of "scales" across cultures, as the validation results suggest that any level of endorsement of depressive or anxiety symptoms may be clinically relevant in this population. This could suggest a cultural orientation towards not emphasizing that these symptoms are bothering them "quite a bit" or "extremely." The HSCL-25 mean scores on endorsed items for cases is much lower than similar mean scores established elsewhere (Mouanoutoua *et al*., 1995; Hinton *et al*., 1994; Derogatis *et al*., 1974), also supporting a possible under-reporting of severity of psychological distress in this population. The findings further support the likelihood of cultural influences on the experience and expression of emotional states (Jenkins

et al., 1990; Lutz, 1985; Good *et al*., 1985), and emphasize the importance of re-norming adapted standardized screening instruments.

The inability of the HSCL in this setting to reflect well the severity of depressive symptomatology is a major limitation on its use. The validated cut-off points close to 1.0 (indicating no symptomatology) suggests need to expand upon this basic tool in the future to refine the identification of levels of psychosocial intervention that may be needed on an individual basis. It is likely that there are local idioms that are not part of the standard construct of depression and hence not included in the HSCL-25 that might further improve the sensitivity and specificity for detecting major depression in this population. Another methodological limitation is in the conduction of this validation study among an HIV-positive cohort of pregnant women. It is important to note that all women in this sample had not progressed to AIDS at the time of the interview and the cohort was drawn from a larger group of women accessing general antenatal services at clinics in Dar es Salaam. While there is minimal information on the behaviour of conventional screening instruments in populations of pregnant women, there are suggestions that at least in the postnatal period, equivalent rates for major depressive disorders with minimal overlap occur with a variety of self-report symptom inventories (Muzik *et al*., 2000). There is, however, sufficient evidence to argue for a need for further studies that replicate the reported properties of the HSCL 25 and its subscales in HIV negative pregnant women and primary care populations outside antenatal care.

In conclusion while the HSCL-25 is a useful screening tool for depression at primary care in Dar es Salaam, it is not as informative for detecting severity of symptomatology. Additional in depth research utilizing qualitative methods of inquiry to gather information is needed to identify symptoms of major depression that may be specific to the Tanzanian context and other developing countries where HIV is highly prevalent. This will allow for the further adaptation of standardized instruments to improve accuracy in measurements of symptom severity in resource-poor settings.

Acknowledgements

The authors wish to acknowledge women who participated in the study and the research assistants who worked collaboratively with them to collect the data. We would also like to thank all of the co-investigators and co-workers who contributed to this manuscript and the larger study. This research was made feasible through a grant from the National Institute of Mental Health, USA (R03 MH55451). The primary grant for this research study is from the National Institute of Child Health and Development (R01-HD32257).

REFERENCES

Assael, M., Namboze, J.M., German, G.A., & Bennet, F.J. (1972) Psychiatric disturbances during pregnancy in a rural group of African women. *Social Science and Medicine,* 6:387-395.

Atkinson, J.H., Grant, I., Kennedy, C., Richman, D.D., Spector, S.A., McCutchan, J.A. (1988) Prevalence of psychiatric disorders among men infected with human immunodeficiency virus. ***Archives of General Psychiatry,*** 45:859-86.

Atkinson, J.H., Grant, I. (1997) Mood disorder due to human immunodeficiency virus: yes, no, or maybe? *Seminars in Clinical Neuropsychiatry,* 2:276-284.

Bailey, K.D., (1982) *Methods of social research* (2nd edition). The Free Press, New York.

Belkin, G.S., Fleishman, J.A., Stein, M.D., Piette, J., Mor, V. (1992) Physical symptoms and depressive symptoms among individuals with HIV infection. ***Psychosomatics,*** 33:416-27.

Bhat, A., Tomenson, B., Benjamin, S. (1989) Transcultural patterns of somatization in primary care: A preliminary report. *Journal of Psychosomatic Research,* 33:671-680.

Bornstein, R.A., Pace, P., Rosenberger, P., Nasrallah, H.A., Para, M.F., Whitacre, C.C., Fass, R.J. (1993). Depression and neuropsychological performance in asymptomatic HIV infection. *American Journal of Psychiatry*, 150(6), 922-927

Broadhead, W.E., Gehlbach, S.H., Degruy F.V., Kaplan B.H. (1988) The Duke-UNC Functional Social Support Questionnaire. *Medical Care*, 26(7):709-23

Brown, G.R., Rundell, J.R. (1990) Prospective study of psychiatric morbidity in HIV-seropositive women without AIDS. *General Hospital Psychiatry,* 12(1); 30-35

Bullinger, M. (1995) German translation and psychometric testing of the SF-36 health survey: preliminary results from the IQOLA Project. *Social Science Medicine,* 41(10):1359-1366.

Burack, J.H., Barrett, D.C., Stall, R.D., Chesney, M.A., Ekstrand, M.L., Coates, T.J. (1993) Depressive symptoms and CD4 lymphocyte decline among HIV-infected men. ***Journal of the American Medical Association,*** 270(21):2568-73.

Cherian, V.I., Peltzer, K., Cherian, L. (1988) The factor-structure of the Self Reporting Questionnaire (SRQ-20) in South Africa. *East African Medical Journal*, 75(11); 654-656.

Cochran, S.D., Mays, V.M. (1994) Depressive distress among homosexually active African American men and women. ***American Journal of Psychiatry,*** 151(4):524-9.

Cox, J.L. (1979) Psychiatric morbidity and pregnancy: A controlled study of 263 semi-rural Ugandan women. *British Journal of Psychiatry,* 134:401-405.

Dennerstein, L. (1993) Psychosocial and mental health aspects of women's health. *World Health Statistics Quarterly*, 46(4): 234-236

Derogatis, L.R., Lipman, R.S., Rickels, K., Uhlenhuth, E.H., Covi, L. (1974). The Hopkins Symptom Checklist (HSCL): a self-report symptom inventory. *Behavioral Science*, 19(1), 1-15.

Derogatis, L.R., Lipman, R.S., & Covi, L. (1973). SCL-90: an outpatient psychiatric rating scale—preliminary report. *Psychopharmacology Bulletin*, 9(1), 13-28.

Drebing, C.E., Van Gorp, W.G., Hinkin, C., Miller, E.N., Satz, P., Kim, D.S., Holston, S., D'Elia, L.F. (1994). Confounding factors in the measurement of depression in HIV. *Journal of Personality Assessment*, 62(1), 68-83.

Dunn, G., Pickles, A., Tansella, M., Vazquez-Barquero, J.L. (1999). Two-phase epidemiological surveys in psychiatric research. ***British Journal of Psychiatry***, 174, 95-100.

Evans, D.L., Leserman, J., Pedersen, C.A., Golden, R.N., Lewis, M.H., Folds, J.A., Ozer, H. (1989). Immune correlates of stress and depression. *Psychopharmacology Bulletin*, 25(3), 319-324.

Fawzi, W.W., Msamanga G.I., Spigelman, D., Urassa, E.J., Hunter, D.J. (1999) Rationale and design of the Tanzania Vitamin and HIV infection trial. *Controlled Clinical Trials,* 20(1): 75-90

First, M.B., Gibbon, M., Spitzer, R.L., Williams, J. (1995) *Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I), Research Version 2.0* (Draft). NY: State Psychiatric Institute, NY.

Fukunishi, I., Matsumoto, T., Nehishi, M., Hayashi, M., Hosaka, T., Moriya, H. (1997) Somatic complaints associated with depressive symptoms in HIV-positive patients. ***Psychotherapy and Psychosomatics***, 66(5):248-51.

Geisinger, K.F. (1994) Cross-cultural normative assessment: Translation and adaptation issues influencing the normative interpretation of assessment instruments. *Psychological Assessment,* 6(4):304-312.

Goldberg, D., Gater, R. (1996) Implications of the World Health Organization study of mental illness in general care for training primary health care staff. *British Journal of General Practice,* 46(409): 483-485.

Hansson, L., Nettelbladt, P., Borgquist, L., Nordstrom, G. (1994) Screening for psychiatric illness in primary care: A cross-sectional study in a Swedish health district. *Social Psychiatry and Psychiatry Epidemiology,* 29(2):83-87.

Hesbacher, P.T., Rickels, K., Morris, R.J., Newman, H., & Rosenfeld, H. (1980). Psychiatric illness in family practice. *Journal of Clinical Psychiatry*, 41(1), 6-10.

Hinton, W.L., Du, N., Chen, Y.C., Tran, C.G., Newman, T.B., Lu, F.G. (1994). Screening for major depression in Vietnamese refugees: a validation and comparison of two instruments in a health screening population, *Journal of General Internal Medicine*, 9(4):202-6.

Kalichman, S.C., Sikkema, K.J., Somlai, A. (1995). Assessing persons with human immunodeficiency virus (HIV) infection using the Beck Depression Inventory: disease processes and other potential confounds. ***Journal of Personality Assessment***, 64(1):86-100.

Kaplan, M.S., Marks, G., Mertens, S.B. (1997) Distress and coping among women with HIV infection: preliminary findings from a multiethnic sample. ***American Journal of Orthopsychiatry,*** 67(1):80-91

Karlsson, H., Joukamaa, M., Lehtinen, V. (2000) Differences between patients with identified and non identified psychiatric disorders in primary care. *Acta Psychiatrica Scandinavica*, 102(5):354-8

Katon, W., Sullivan, M.D. (1990) Depression and chronic medical illness. ***Journal of Clinical Psychiatry,*** 51(supplement 6):3-11.

Katon, W., Walker, E. (1998) Medically unexplained symptoms in primary care. *Journal of Clinical Psychology*, 59(supplement 20):15-21.

Kennedy, C.A., Skurnick, J.H., Foley, M., Louria, D.B. (1995) Gender differences in HIV-related psychological distress in heterosexual couples. ***AIDS Care,*** 7(Suppl. 1): S33-8.

Kessler, R.C., Foster, C., Joseph, J., Ostrow, D., Wortman, C., Phair, J., Chmiel, J. (1991) Stressful life events and symptom onset in HIV infection. ***American Journal of Psychiatry,*** 148:733-8.

Kirmayer, L.J. (1989) Cultural variations in the response to psychiatric disorders and emotional distress. *Social Science and Medicine,* 29(3):327-339.

Kleinman, A. (1977) Depression, somatization, and the "new cross-cultural psychiatry." *Social Science and Medicine,* 11(1):3-9.

Koonin, L.M., Ellerbrock, T.V., Atrash, H.K., Rogers, M.F., Smith, J.C., Hogue, C.J., Harris, M.A., Chavkin, W., Parker, A.L., & Halpin, G.J. (1989) Pregnancy-associated deaths due to AIDS in the United States. ***Journal of the American Medical Association,*** 261:1306-9.

Lambo, T.A. (1964) The village of Aro. *Lancet,* 2:513-4.

Lyketsos, C.G., Hoover, D.R., Guccione, M., Dew, M.A., Wesch, J.E., Bing, E.G., & Treisman, G.J. (1996). Changes in depressive symptoms as AIDS develops. The Multicenter AIDS Cohort Study. ***American Journal of Psychiatry***, 153(11), 1430-1437..

Maj, M., Janssen, R., Starace, F., Zaudig, M., Satz, P., Sughondhabirom, B., Luabeya, M.A., Riedel, R., Ndetei, D., Calil, H.M., & *et al*. (1994). WHO Neuropsychiatric AIDS study, cross-sectional phase I. Study design and psychiatric findings. ***Archives of General Psychiatry***, 51(1), 39-49..

Maser, J.D., Kaelber, C., Weise, R.E. (1991) International use and attitudes towards DSM-III and DSM-III-R: growing consensus in psychiatric classification. *Journal of Abnormal Psychology,* 100(3); 271-279.

McClure, J.B., Catz, S.L., Prejean, J., Brantley, P.J., & Jones, G.N. (1996) Factors associated with depression in a heterogeneous HIV-infected sample. ***Journal of Psychosomatic Research,*** 40(4):407-15.

McKelvey, R.S., & Webb, J.A. (1997). A prospective study of psychological distress related to refugee camp experience. *Australian and New Zealand Journal of Psychiatry*, 31(4), 549-554

Mollica, R.F., Wyshak, G., de Marneffe, D., Khuon, F., & Lavelle, J. (1987). Indochinese versions of the Hopkins Symptom Checklist-25: a screening instrument for the psychiatric care of refugees. *American Journal of Psychiatry*, 144(4), 497-500.

Mouanoutoua V.L., Brown, L.G. (1995) Hopkins Symptom Checklist-25, Hmong version: A screening instrument for psychological distress. *Journal of Personality Assessment,* 64(2) 376-383.

Nunally, J.C., Bernstein, I.H. (1995) *Psychometric Theory*: *Series in Psychology*. McGraw-Hill Inc. New York, pp 96-97

O'Dell, M.W., Meighen, M., Riggs, R.V. (1996) Correlates of fatigue in HIV infection prior to AIDS: a pilot study. ***Disability & Rehabilitation,*** 18(6):249-54.

Ostrow, D.G., Monjan, A., Joseph, J., VanRaden, M., Fox, R., Kingsley, L., Dudley, J., & Phair, J. (1989). HIV-related symptoms and psychological functioning in a cohort of homosexual men. ***American Journal of Psychiatry,*** 146(6):737-42.

Parloff, M.B., Kelman, H.C., Frank, J.D. (1954) Comfort effectiveness and self-awareness as criteria for improvement in psychotherapy. *American Journal of Psychiatry,* 3: 343-351.

Parry, C.D.H. (1996) A review of psychiatric epidemiology in Africa: Strategies for increasing validity when using instruments transculturally. *Transcultural Psychiatric Research Review*, 33:173-188.

Patel, V., Araya, R., de Lima, M., Ludermir, A., & Todd, C. (1999). Women, poverty and common mental disorders in four restructuring societies. *Social Science and Medicine*, 49(11), 1461-1471.

Penayo, U., Kullgren, C., Caldera, T (1990) Mental disorders among primary health care patients in Nicaragua. *Acta Psychiatrica Scandinavica* 82:82

Perkins, D.O., Leserman, J., Stern, R.A., Baum, S.F., Liao, D., Golden, R.N., & Evans, D.L. (1995). Somatic symptoms and HIV infection: relationship to depressive symptoms and indicators of HIV disease. ***American Journal of Psychiatry***, 152(12), 1776-1781..

Perkins, D.O., Stern, R.A., Golden, R.N., Murphy, C., Naftolowitz, D., & Evans, D.L. (1994). Mood disorders in HIV infection: prevalence and risk factors in a nonepicenter of the AIDS epidemic. ***American Journal of Psychiatry***, 151(2), 233-236.

Perry, S., Jacobsberg, L.B., Fishman, B., Frances, A., Bobo, J., & Jacobsberg, B.K. (1990). Psychiatric diagnosis before serological testing for the human immunodeficiency virus. ***American Journal of Psychiatry***, 147(1), 89-93.

Rabkin, J.G., Ferrando, S.J., Jacobsberg, L.B., & Fishman, B. (1997). Prevalence of axis I disorders in an AIDS cohort: a cross-sectional, controlled study. ***Comprehensive Psychiatry***, 38(3), 146-154.

Rabkin, J.G., Rabkin, R., & Wagner, G. (1994). Effects of fluoxetine on mood and immune status in depressed patients with HIV illness. *Journal of Clinical Psychiatry*, 55(3), 92-97.

Reichlin, S. (1993). Neuroendocrine-immune interactions. ***New England Journal of Medicine***, 329(17), 1246-1253..

Riskind, J.H., Beck, A.T., Berchick, R.J., Brown, G., Steer, R.A. (1987) Reliability of DSM-III diagnoses for major depression and generalized anxiety disorder using the structured clinical interview for DSM-III. *Archives of General Psychiatry,* 44(9):817-20

Rothenberg, R., Woelfel, M., Stoneburner, R., Milberg, J., Parker, R., & Truman, B. (1987). Survival with the acquired immunodeficiency syndrome. Experience with 5833 cases in New York City. ***New England Journal of Medicine,*** 317(21), 1297-1302.

Sebit, M.B. (1995). Neuropsychiatric HIV-1 infection study: in Kenya and Zaire cross-sectional phase I and II. ***Central African Journal of Medicine***, 41(10), 315-322.

Selwyn, P.A., Schoenbaum, E.E., Davenny, K., Robertson, V.J., Feingold, A.R., Shulman, J.F., Mayers, M.M., Klein, R.S., Friedland, G.H., & Rogers, M.F. (1989). Prospective study of human immunodeficiency virus infection and pregnancy outcomes in intravenous drug users. Journal of the American Medical Association, 261(9), 1289-1294.

Sen, B. (1987) An analysis of the nature of depressive phenomena in primary health care utilizing multivariate statistical techniques. Acta Psychiatrica Scandinavica, 76:28.

Spitzer, R.L., Williams, J.B., Gibbon, M., First, M.B. (1992) The Structured Clinical Interview for DSM-III-R (SCID). I: History, rationale, and description. Archives of General Psychiatry, 49(8):624-9

Sullivan, M., Karlsson, J., Ware, J. (1995) The Swedish SF-36 Health Survey: I. Evaluation of data quality, scaling assumptions, reliability and construct validity across general populations in Sweden. Social Science and Medicine, 41(10): 1349-1358.

UNAIDS. (2000) AIDS Epidemic Update: December 2000. UNAIDS/00.44E– HO/ CDS/ CSR/ EDC/ 2000.9

Ustun, T.B., Van Korff, M. (1995) Primary Mental Health Services: Access and Provision of Care. In (Eds.) Ustun T.B., Sartorius N. Mental Illness in General Health Care: An International Study. John Wiley and Sons: New York; pp 347-360.

van de Vijver, F.J.R., Poortinga, Y.H. (1997) Towards and integrated analysis of Bias in cross-cultural assessment. European Journal of Psychological Assessment, 13(1): 29-37

Wagner, A.K., Wyss, K., Gandek, B., Kilima, P.M., Lorenz, S., & Whiting, D. (1999). A Kiswahili version of the SF-36 Health Survey for use in Tanzania: translation and tests of scaling assumptions. Quality of Life Research, 8(1-2), 101-110.

Williams, J.V.W., Rabkin, J.G., Remien, R.H., Gorman, J.M., Ehrhardt, A.A. (1991) Multidisciplinary baseline assessment of homosexual men with and without human immunodeficiency virus infection, II: standardized clinical assessment of current and lifetime psychopathology. Archives General Psychiatry; 48:124-30.

Winokur, A., Winokur, D.F., Rickels, K., & Cox, D.S. (1984). Symptoms of emotional distress in a family planning service: stability over a four-week period. British Journal of Psychiatry, 144, 395-399.

Wyss, K., Wagner, A.K., Whiting, D., Mtasiwa, D.M., Tanner, M., Gandek, B., Kilima, P.M. (1999). Validation of the Kiswahili version of the SF-36 Health Survey in a representative sample of an urban population in Tanzania. Quality of Life Research, 8(1-2), 111-120.

Chapter Five

Socio-economic and partner relationship factors associated with antenatal depressive morbidity among pregnant women in Dar es Salaam, Tanzania

Manuscript accepted as: Kaaya, S.F., Mbwambo, J.K., Kilonzo, G.P. van den Borne, H., Leshabari, M.T., Smith-Fawzi, M.C., Schaalma, H. (in press) Socio-economic and partner relationship factors associated with antenatal depressive morbidity among pregnant women in Dar es Salaam, Tanzania. *Tanzania Journal of Health Research*

ABSTRACT

Depression during pregnancy may negatively influence social functioning, birth outcomes and postnatal mental health. A cross-sectional analysis of the baseline survey of a prospective study was undertaken with an objective of determining the prevalence and socio-demographic factors associated with depressive morbidity during pregnancy in a Tanzanian peri-urban setting. Seven hundred and eighty seven second to third trimester pregnant women were recruited at booking for antenatal care at two primary health care clinics. Prenatal structured interviews assessed socio-economic, quality of partner relationships and selected physical health measures. Depressive symptoms were measured at recruitment and three and eight months postpartum using the Kiswahili version of the Hopkins Symptom Checklist (KHSCL). Completed antenatal measures available for 76.2% participants, showed a 39.5% prevalence of depression. Having a previous depressive episode (OR 4.35, $p<0.01$), low (OR 2.18, $p<0.01$) or moderate (OR 1.86, $p=0.04$) satisfaction with ability to access basic needs, conflicts with the current partner (OR 1.89, $p<0.01$), or booking earlier for antenatal care (OR 1.87, $p=0.02$) were independent predictors of antenatal depression in the logistic regression model; together explaining 21% of variance in depression scores. Attenuation of strength of multivariate associations suggests confounding between the independent risk factors and socio-demographic and economic measures. Clinically significant depressive symptoms are common in mid and late trimester antenatal clinic attendees. Interventions for early recognition of depression should target women with a history of previous depressive episodes or low satisfaction with ability to access basic needs, conflict in partner relationships and relatively earlier booking for antenatal care. Findings support a recommendation that antenatal services consider integrating screening for depression in routine antenatal care.

INTRODUCTION

Studies show the second and third trimester of pregnancy are associated with risk for depression, with findings of meta-analysis estimating point prevalence of 12.8% and 12.0% respectively (Bennet, *et al*, 2004). Rates of depression during pregnancy are perhaps higher or comparable to rates in the postnatal period when assessed using screening (Rich-Edwards *et al*, 2006; Limlomwongse & Liabsuetrakul, 2006; Wissart & Kulkarni, 2005; Haas *et al*, 2004; Edge *et al*, 2004; Josefsson *et al*., 2001) or diagnostic interviews (Kitamura *et al*, 2006). A continuum of disorder from the antenatal period is likely as studies show about a third of postnatal depressive episodes have onset during pregnancy (Felice, *et al*., 2007; Kitamura *et al*., 2006; Johanson *et al*., 2000). Some evidence shows most depressed pregnant women do not receive specific treatment (Carter *et al*, 2005; Marcus *et al*., 2003).

Depression during pregnancy may negatively influences social and personal adjustment, marital relationships (Kazi *et al*., 2006; Hart *et al*., 2006) and the mother-infant interaction (Koubovec *et al*, 2005; Murray *et al*., 2001) through influences on the occurrence of postnatal depression. Studies also show associations between antenatal depression and poor infant outcomes (low birth weight, preterm delivery or both) in low (Rahman *et al*., 2007; Patel, 2006; Rahman *et al*., 2004) and middle-income countries (Rondo *et al*., 2003). In high-income countries, findings of associations between antenatal depression and infant outcomes are limited (Andersson *et al*., 2004; Hoffman & Hatch, 2000; Perkin *et al*., 1993), except in economically disadvantaged women (Hoffman and Hatch, 2000; Rini, *et al*., 1999; Hickey *et al*., 1995). Lack of recognition or treatment of depression during pregnancy may increase the risk of poor nutrition and ability to follow through health care recommendations including limiting alcohol, smoking and substance abuse, all of which can potentially result in adverse perinatal outcomes (Larsson *et al*., 2004; Chung *et al*., 2001; Hoffman and Hatch, 2000).

In sub-Saharan African (SSA), antenatal care settings, high prevalence of physical health problems, pose unique challenges to recognition of depression during pregnancy. Anaemia, for example, occurs in 16.0%—26.0 % of antenatal care attendees in Tanzania (Nganda *et al*., 2004; Massawe, *et al*., 1999), and can present with fatigue, weakness and tiredness, symptoms that are also associated with depressive morbidity. A Nigerian study suggests higher depressive symptom endorsement in pregnant compared to matched non-pregnant women (Fatoye *et al*., 2004). The few, prevalence studies among pregnant women in SSA suggest probable or definite psychiatric morbidity is high, with rates ranging from 19.0% to 42.0% (Adewuya *et al*., 2007; Nhiwatiwa *et al*. 1998, Aderibigbe *et al*., 1993). Nhiwatiwa *et al*., (1998), used a locally validated screening tool in Zimbabwe, to show 19% prevalence of probable antenatal psychiatry morbidity, with half of those affected reporting depressed mood, anxiety, worry fatigue and sleep disturbances. Adewuya, *et al*.

(2007) showed a 42% prevalence of significant depressive symptoms in peri-urban third-trimester pregnant women in Nigeria and an 8.0% prevalence of depressive disorder.

There is some evidence that primary care health workers in SSA, who are the main providers of antenatal services, poorly recognize depression (Whyte, 2001; Gureje *et al*., 1997). Knowledge of psychosocial risk factors for antenatal depression in these settings can alert providers to the possibility of depressive disorder. Studies show several psychosocial predictors of antenatal depression. More immediate proximal factors include marital satisfaction or conflict (Records & Rice, 2007; Adewuya *et al*, 2007; Rich-Edwards *et al*, 2006), inadequate social support (Records & Rice, 2007; Pajulo *et al*, 2001), and single motherhood (Faisal-Curry *et al*, 2007; Adewuya *et al*, 2007; Limlomwongse & Liabsuetrakul, 2006). More distal or longer-term factors include history of smoking (Chen *et al*, 2004; Marcus *et al*, 2003; Kitamura *et al*, 1996), and childhood abuse (Farber *et al*, 1996). Low socio-economic status defined by level of education, income or employment status, has been associated with antenatal depression in some studies (Faisal-Curry *et al*, 2007; Haas *et al*., Lovisi *et al*., 2005; 2004; Marcus *et al*., 2003; Hoffman *et al*., 2000). Two SSA studies did not find associations between antenatal depression and socio-economic status; however, socio-economic status measures were unclear or relied on occupation status of participants or partners (Adewuya *et al*., 2007; Fatoye *et al*., 2004). Formative studies can help generate locally sensitive socio-economic measures, as observed by Patel (1998), who among women in Zimbabwe associations between common mental disorders and locally subjective (inability to purchase food) and objective (lack of financial savings) socio-economic status measures. The objectives of these analyses were to estimate the prevalence of significant depressive symptoms in pregnant women booking for care and determine associations with a) socio-demographic and economic status measures b) quality of relationships with current partners and selected general health measures.

METHODS

Study design and participants

A mixed methods study with formative qualitative and a prospective survey was conducted in the Chamazi and Mbagala peri-urban wards in Dar es Salaam City, Tanzania. A formative phase conducted unstructured interviews with community leaders, women key informants and traditional practitioners; and information derived used to develop sensitive quantitative survey measures. The prospective survey recruited a cohort of 787 consecutive antenatal care attendees registering for care at two clinics serving the wards. Survey participants were included if gesta-

tional age was 32 weeks of less, planned residence in Dar es Salaam for at least a year post delivery and intentions to attend infant growth monitoring visits at the clinics.

Measurements

Socio-demographic, economic, and reproductive and other health status measures, collected at study recruitment and quality of relationship with the partner assessed 4-6 months later at 36 weeks gestation.

Socio-demographics: Participant had to indicate their age, marital and education status, parity, and the number of children below the age of 18 years in the home.

Socio-economic Status: To index socio-economic status, we assessed engagement in the past year in activities that earned cash income, household assets and characteristics, and satisfaction with participant's ability to access basic needs. Measures were developed from information collected during the formative study.
Household assets and characteristics Formative study key informants identified ten household assets and characteristics as indicators of wealth. These included four characteristics (having a cement screed floor, a wooden external door, concrete brick walls and corrugated iron sheet roofing) and six assets (owning a bicycle, television, refrigerator, car or motorbike, radio and a vendor's kiosk or shop). Participants had to indicate if their household included these aspects. Affirmative responses were scored one and negative responses zero.

Satisfaction with ability to access basic needs: A set of questions required respondents to indicate satisfaction with their personal ability to access four basic needs in the previous 12 months as identified by formative study key informants. These included to: 1) cook at least one meal a day 2) purchase clothes for self 3) purchase sufficient amount of food for household 4) live in the type of accommodation they desired. Responses to satisfaction items ranged from one "not at all" to four "very satisfied".

Relationship Quality: Individual items assessing partner relationship quality included participant's perception of the overall quality of relationship with their current partner, rated on a 3-point scale from very good (1) to poor (3). Also assessed was presence or not of conflicts with their current partner/spouse during the previous 12 months using a 3-point scale from no conflicts (1), verbal conflicts (2) and any physical confrontations (3); and presence or absence of partner fidelity during the same time frame (responses yes, unsure or no). Practical help from partners during the index pregnancy assessed by a single item explored partner's involvement in any of two household chores (fetching water and firewood/coal for cooking and assisting in cooking and cleaning) with yes or no response options. The formative phase showed the degree of a woman's autonomy/involvement in decisions

related to household expenditure suggested greater respect from her partner/spouse. Women responded to items assessing involvement in the previous year in decisions related expenditure on: 1) health care of family members, 2) food, and 3) other household purchases and responses including decisions made alone, shared with partner, made by partner alone or other person(s).

Reproductive and Other Health Measures: Reproductive health measures included gestational age at booking for antenatal care, history of any abortions (defined as foetal loss before 28 weeks gestation) or stillbirths. Since alcohol use may be a correlate of depression and relationship quality (Flynn, 2007; Salokangas, 1998), participants responded to questions on lifetime alcohol use (selves and partner) and frequency of partner's alcohol use. Other measures included life-time and past year experience of depressed mood (lasting two weeks or more) assessed using the Rost two-item screener (Rost *et al*., 1993), blood haemoglobin level and microscopic evidence of malaria parasites on Field stained thin blood slides (Chatterjee, 1980).

Current Symptoms of Depression: Assessment of current depressive symptoms at recruitment was by face-to-face interviews with a Kiswahili adapted version of the Hopkins Symptom Checklist (KHSCL). The KHSCL demonstrated good reliability, convergent and discriminant validity in pregnant women (Lee *et al*., 2008). In these analyses, depression assessment utilizes a KHSCL version validated against DSM-IV major depression diagnosis in pregnant women in Dar-es-Salaam (Kaaya *et al*. 2002).

Study procedures

The ethics committee of the Muhimbili University College of Health Sciences approved the study. The investigators (SK, JK and ML) assisted by two sociology graduates consented, recruited and interviewed all key informants, during the formative phase including community leaders (n=4), who also assisted in the selection of traditional practitioner (n=12) and women (n=10) in-depth interview informants in communities served by the study clinics. Thematic areas of interest informing development of survey instruments relevant for these analyses include informant's perceptions on indicators of household wealth, and marital and cohabiting relationships during pregnancy. Details of the formative survey design and some findings are described elsewhere (Kaaya *et al in press*).

Pregnant women registering for antenatal care meeting inclusion criteria were consented and interviewed at recruitment. Follow up assessments occurred at 36 weeks gestation and at 6-12 weeks and 8 to 12 months after delivery. In the absence of working laboratories at both clinics, trained research nurse mid-wives collected blood for haemoglobin estimation and prepared thin blood smears from capillary blood draws. A hemocue machine, calibrated after every 10th sample, es-

timated haemoglobin levels onsite at each clinic. Collected thin blood smears assessed at a university research laboratory for presence and type of malaria parasites allowed for results within 1-2 days of preparing blood slides. Assessed blood smears identified *Plasmodium falciparum* in all positive slides. A second slide prepared for every seventh sample collected and sent to a separate laboratory for validation, resulted in 116 separately analyzed pairs, and an 86% concordance rate for detecting presence of malaria parasites.

Statistical analysis

The Statistical Package for the Social Sciences Version 12 (SPSS-12) software program analyzed data. Presented analyses focuses on data from 600 (76.2%) completed antenatal assessments. Missed visits (n=187) were due to residence changes (n=88, 47.1%), discharge from follow-up (n=52, 27.8%) either due to foetal loss/stillbirth (n=43) or death of the participant and/or the infant (n=9). For 25.1% reasons for missed visits were not available. The distribution of socio-demographic measures (age, education level, marital status, employment in the year prior to assessment), were not significantly different in participants with a single compared to those with both prenatal measures.

Significant depressive morbidity defined as a score at or above 1.06 on the KHSCL and participants scoring below this threshold categorized as not depressed. Categorical summarization of risk factors of interest including socio-demographic, economic, partner relations and health status measures occurred. The mean (SD) household assets and characteristics scores was 4.70 (1.49) and each item was weighted, after extracting three factors that together explaining 57.3% of variance in item scores using principal components analysis. Item standardized scoring coefficients of the first component (28.0% of variance explained), were normalized by item standard deviations and used as weights in the computation of the household wealth status index as described by Filmer and Pritchett (2001). The computed wealth status index was negatively skewed (skewness -1.86; mean score (SD) = 0.90 (0.28)), despite log transformation and summarized as tertiles of wealth; scoring at or below the first and second tertiles was defined as relatively low and moderate household wealth respectively while scoring at or above the third as relatively higher wealth. Individual items assessing satisfaction with ability to access basic needs (values 1-4) were positively correlated (Spearman's *rho* 0.36—0.59; all p values <0.01) and combined in a single summed satisfaction measure that had a mean score (SD) of 2.86 (0.51); higher mean scores indicating greater satisfaction. The satisfaction scale had adequate internal consistency with a Cronbach's alpha score of 0.79, but was negatively skewed (-0.83) this not being improved by log transformation. Tertiles summarized the satisfaction scale, the first to third defined as lower, moderate and higher satisfaction respectively for these analyses.

Items assessing respondent's involvement in decisions related to household expenditure were highly correlated (Spearman's rho 0.88—0.92) and due to its higher variability, analysis focused on one item, involvement in expenditure decisions related to a family member's health care. Conflict with the current partner was coded yes if respondent reported frequent verbal or any physical confrontation and no if these responses were not endorsed. Measures for lifetime depressive episodes (present or absent), baseline haemoglobin (11gm/dl and above normal and low if below 11 gm/dl) presence or absence of malaria parasites in thin blood smear were also dichotomized. Frequencies (percentage) and mean scores (SD) where appropriate are reported for both current depressive symptoms and independent variable measures. Chi-Square estimates assessed variance and significance determined at $p<0.05$; Odds ratios and 95% Confidence Intervals (CI) are also reported. Independent variables associated with baseline depressive morbidity at p-values of <0.20 were considered for logistic regression analyses (Hosmer and Lemeshow, 2000). A backwards removal method including items at p-value 0.05 and removing items at $p=0.10$ was utilized after forced entry of demographic variables.

RESULTS

Distribution of Socio-demographic, Economic, Partner Relations and Health Status Measures

Table 1 summarizes socio-demographic and wealth status measures of participants with completed prenatal visits. Participants were generally young of mean age (SD) 25.1±5.8 years and lived with partners in marital or cohabiting relationships; amongst the 62% (n=372) that knew their partner's age, partners were generally older with mean (SD) age 32.6 ±8.4 years. Over two thirds had completed seven or more years of formal education, but only 6.4% achieved more than the compulsory seven years of primary education. Less than a fourth were employed in a cash earning activity in the year prior to assessment and 28.4% were categorized as having relatively lower household wealth status. Almost third (27.7%) expressed low satisfaction with ability to afford basic needs in the year prior to assessment. More than a quarter were experiencing their first pregnancy and less than a fifth reported four or more children below the age of 18 years living in the home at the time of assessment.

Table 1: Socio-demographic and economic characteristics of pregnant women booking for antenatal care (N=600)

Characteristic	Total N[1] (%)
Respondents age (years)	
20 or younger	158 (26.7)
21 to 24	144 (24.4)
25 to 28	138 (23.4)
29 and older	151 (25.5)
Current partner's age (years)	
24 or younger	74 (9.4)
25 to 34	242 (30.7)
35 or older	169 (21.4)
Did not know	303 (38.5)
Marital status	
Single/separated/divorced	90 (15.1)
Married/ cohabiting	507 (84.9)
Years of formal education	
None	106 (17.8)
One to six	90 (15.1)
Seven or more	401 (67.2)
Employed/self employed in the year prior to assessment	
Yes	137 (22.8)
No (housewives and subsistence farming)	463 (77.2)
Parity	
Primigravida	159 (26.5)
Gravida 1-3	261 (43.5)
Gravida 4 or more	180 (30.0)
Number of children below 18 years in the home	
None	122 (20.4)
One to three	365 (60.8)
Four or more	112 (18.7)
Household wealth status	
Relatively low	170 (28.4)
Moderate	197 (32.9)
Relatively high	232 (38.7)
Tertiles of satisfaction with ability to purchase basic needs in the past year	
Low satisfaction	218 (27.7)
Moderately satisfied	106 (13.5)
Higher satisfaction	464 (58.9)

Key: 1 Column totals less than 600 indicative of missing responses

Table 2 summarizes findings of women's perceptions on quality of the relationship with the current partner and selected health status measures. Most women (73.0%) reported a moderately to very good relationship with the current partner. In the year prior to assessment more than half reported involvement in decisions related to expenditure for health care of family members (either solely or with their partner) and receiving practical help from partners relating to household chores. Over a fifth reported some conflicts with partners in the year prior to assessment and less than a third (28.4%) were certain of their partner's fidelity in the year prior to as-

sessment, most (62.6%) being uncertain. Booking for antenatal care generally occurred late, 87.2% booking in the third and none in the first trimester of pregnancy. About a fifth (20.7%) had ever experienced an abortion and 4.7% a stillbirth. A considerable proportion was anaemic at booking for antenatal care with only 27.3% satisfying the WHO recommendation of haemoglobin levels at or above 11g/dl; malaria parasites were present in a fifth of assessed thin blood smears. Over a fifth reported partner's recent (past year) use of alcohol; more than half (56.5%) reporting that partners/spouses drank once weekly or more frequently. Endorsement of previous experience of a depressive episode occurred for 18.8% of the participants and at recruitment 39.5% scored at or above the threshold for depression caseness on the KHSCL and categorized as having probable depressive morbidity.

Table 2: Unadjusted socio-demographic, economic, partner relationship and selected health measures associated with depressive symptoms in second and third trimester women attending antenatal clinics (N=600)

Characteristic	**Total N (%)**[1]	**Depressive Symptoms n (%)**	**OR; (95% CI)**[4]	**p-value**[5]
Socio-demographic and economic factors				
Number of children below 18 years in the home				
None	122 (20.4)	44 (36.1)	1.00	
One to three	365 (60.8)	141 (38.6)	1.12 (0.73, 1.71)	0.61
Four or more	112 (18.7)	51 (45.5)	1.48 (0.88, 2.50)	0.14
Parity				
Primigravida	159 (26.5)	52 (32.7)	1.00	
Gravida 1-3	261 (43.5)	113 (43.3)	1.57 (1.04, 2.37)	0.03
Gravida 4 or more	180 (30.0)	72 (40.0)	1.37 (0.88, 2.14)	0.17
Employed/self employed in cash earning activity in the year prior to assessment				
Yes	137 (22.8)	67 (48.9)	1.65 (1.12, 2.42)	0.01
No	463 (77.2)	170 (36.7)	1.00	
Household wealth status				
Relatively low	170 (28.4)	78 (45.9)	1.47 (0.98, 2.19)	0.06
Moderate	197 (32.9)	73 (37.1)	1.02 (0.69, 1.51)	0.93
Relatively high	232 (38.7)	85 (36.6)	1.00	
Satisfaction with ability to access basic needs in the past year (tertiles)				
Low	218 (27.7)	117 (53.7)	2.47 (1.78, 3.44)	<0.01
Moderate	106 (13.5)	51 (48.6)	2.02 (1.31, 3.10)	<0.01
High	464 (58.9)	148 (31.9)	1.00	
Quality of relationship with partner				
Overall assessment of quality of relationship with current partner				
Very or moderately good	411 (73.0)	61 (40.1)	1.05 (0.72, 1.54)	0.85
Poor	152 (27.0)	160 (38.9)	1.00	

Characteristic	Total N (%)[1]	Depressive Symptoms n (%)	OR; (95% CI)[4]	p-value[5]
Partner helped with household chores during index pregnancy	254 (42.8)	112 (44.1)	1.39 (1.00, 1.94)	0.05
No	340 (57.2)	123 (36.2)	1.00	
Yes				
Inclusion in decisions on health care expenditure in the past year				
No	266 (44.6)	118 (44.4)	1.44 (1.03, 2.00)	0.04
Yes	331 (55.4)	118 (35.6)	1.00	
Misunderstandings or conflicts with partner in the past year				
Some	125 (21.8)	68 (54.4)	2.16 (1.45, 3.22)	<0.01
None	475 (79.2)	169 (35.6)	1.00	
Partner's fidelity in the past year				
Yes	52 (9.1)	26 (50.0)	1.68 (0.90, 3.16)	0.11
Not sure	387 (64.5)	151 (39.0)	1.08 (0.71, 1.57)	0.70
No	161 (28.4)	60 (37.3)	1.00	
Selected health measures				
Gestational trimester at baseline				
Second	77 (12.8)	41 (53.2)	1.90 (1.17, 3.08)	0.01
Third	523 (87.2)	196 (37.5)	1.00	
Life time experience of a depressive episode [2]				
Yes	110 (18.3)	79 (71.8)	5.36 (3.39, 8.45)	<0.01
No	490 (81.7)	158 (32.2)	1.00	
Frequency of alcohol use by partner in the past year				
Once weekly or more	70 (11.7)	33 (47.1)	1.55 (0.93, 2.57)	0.09
Less than once a week	54 (9.0)	30 (55.6)	2.17 (1.23, 3.83)	<0.01
Partner did not drink alcohol	476 (79.3)	174 (36.6)	1.00	
Malaria parasites at recruitment [3]				
Present	118 (19.7)	47 (39.8)	1.04 (0.69, 1.57)	0.87
Absent	449 (74.8)	175 (39.0)	1.00	
Hemoglobin at recruitment (g/dl) [3]				
Less than 11 g/dl	403 (67.2)	158 (39.2)	1.00 (0.69, 1.46)	0.97
11 g/dl or more	164 (27.3)	64 (39.0)	1.00	

Key: [1] Column totals less than 600 indicative of missing responses; computed % is of total respondents except where indicated; [2] Defined as ever experienced sadness or loss of interest in normal activities almost daily for two weeks or more; [3] 13.7% (n=108) of missing measures; accounted for in the analysis; [4] Confidence Intervals; [5] p-values two tailed

Factors associated with probable depressive morbidity

Univariate analyses identified a number of statistically significant associations with probable depressive morbidity (Table 2). Women reporting a lower satisfaction in abilities to access basic needs, engagement in cash earning employment in the year prior to assessment and one or more previous pregnancies were more likely to endorse symptoms equivalent to depressive disorder. There was an insignificant

trend towards a higher likelihood of depressive morbidity with lower compared to higher household wealth status. Age, level of educational attainment and marital/cohabiting status were not significantly associated with such morbidity. Depression was positively associated with three measures of quality of partner relations: misunderstandings or conflicts in the year prior to assessment, lack of assistance with household chores, and lack of the participant's involvement in decisions on health care expenditures for family members. Associations between reported depressive symptoms and the partner's fidelity were marginal. Of the assessed health measures, lifetime experience of a depressive episode, registering early for antenatal care (in the second trimester of pregnancy) and partner's use of alcohol in the year prior to assessment increased the likelihood of reporting depressive symptoms. Experience of foetal loss, low haemoglobin and presence of malarial parasites in peripheral blood smears did not influence endorsement of depressive symptoms.

Table 3: Sequential logistic regression of significant depressive symptoms on selected socio-demographic, economic, partner relationship and health measures in second and third trimester women booking for antenatal care in Dar es Salaam (N=600)

Characteristic	**Depressive Symptoms n (%)[2]**	**OR (95% CI)[3]**	**p-value[4]**
Life time experience of a depressive episode [1]			
Yes	79 (71.8)	4.35 (2.66, 7.11)	<0.01
No	158 (32.2)	1.00	
Satisfaction with ability to access basic needs in the past year (tertiles)	92 (53.8)	2.18 (1.43, 3.31)	<0.01
Low	33 (50.0)	1.86 (1.04, 3.35)	0.04
Moderate	110 (30.8)	1.00	
High			
Misunderstandings or conflicts with partner in the past year			
Frequent verbal /or any physical confrontations	68 (54.4)	1.89 (1.21, 2.95)	<0.01
None	162 (36.1)	1.00	
Gestational trimester at booking for antenatal care			
Second	41 (53.2)	1.87 (1.09, 3.22)	0.02
Third	196 (37.5)	1.00	

Key: [1] Defined as ever experienced sadness or loss of interest in normal activities almost daily for two weeks or more; [2] Column totals less than 237 indicative of missing responses; [3] Confidence intervals (CI); [4] Sequential logistic regression, demographic risk factors (age, parity, number of children in the home) force entered in first block and backwards method used to enter risk factors in second block; Model -2 log likelihood 681.98 Chi sq=95.86, df 13 p<0.01; R2. 0.21

Table 3 summarizes multivariate analyses. Forced entry of demographic risk factors (age, parity and number of children in the home) adjusted for their potential influences in a full effects regression model regressing antenatal depression on identified socio-economic, relationship quality and health status measures. Findings showed ever experiencing a depressive episode was the strongest risk factor increasing

almost four and a half-fold the likelihood of reporting depressive symptoms (OR = 4.35; 95% CI: 2.66, 7.11). Low and moderate satisfaction with ability to access basic needs both increased the likelihood of depressive symptoms about two fold (OR = 2.18; 95% CI: 1.38, 3.27, and OR = 1.86; 95% CI: 1.01, 3.34, respectively). Early booking for antenatal care or misunderstandings or conflicts with respondent's partner in the year prior to assessment each increased by almost two fold the likelihood of reporting depressive symptoms (OR = 1.87; 95% CI: 1.09, 3.22, and OR = 1.89; 95% CI: 1.21, 2.95, respectively). Attenuation in the strength of multivariate model parameter estimates suggested some confounding between demographic, economic and health risk factors with no significant interaction effect identified. The final model explained a modest 21% of variance in depressive symptoms.

DISCUSSION

This study is the first to examine prevalence and correlates of depressive morbidity in HIV status naïve pregnant women in Tanzania. Overall, 39.5% had significant depressive morbidity. The observed prevalence rate of antenatal depression is consistent with reports from diverse cultural settings; for example Kazi *et al*. (2006) in Pakistan and Holzman *et al*. (2005) in Michigan show during pregnancy depression prevalence rates of 39.4% and 34.8% respectively. However Faisal-Curry *et al*., (2007) in Sao Paulo report a much lower antenatal depression rate of 19.6%, though this could be because they recruited clients attending a private health care facility, with relatively higher levels of educational attainment suggesting possible higher socio-economic status. Hence, while differences in screening tools and timing of assessments may partly explain variations in reported prevalence's of depression (Bennet *et al*., 2004), socio-cultural, social support and economic differences across studies may also be contributory.

As has been shown in other studies (Ross *et al*, 2004; Marcus *et al*, 2003) history of a previous episode of depression was independently associated with antenatal depression in multivariate analyses. Experience of previous depressive episodes may indicate biological vulnerability, which indirectly causes pregnancy mood changes through effects on psychosocial stressors and anxiety (Ross *et al*, 2004; Altshuler *et al*., 1998). A number of psychosocial risk factors were determined. Perceived low satisfaction with access to basic needs in the previous year was independently associated with antenatal depressive morbidity. This agrees with findings from other studies that show associations between antenatal depression and subjective economic status measures including perceived lack of money for essentials and self-reported economic difficulties (Rochat *et al*, 2006; Holzman *et al*., 2006; Haas *et al*., 2004; Pajulo *et al*., 2001). While some studies show associations between antenatal depression and more objective economic status (Faisal-Cury *et al*, 2007) or standard

of living (Baker *et al*, 1997) this was not the case in these analyses, perhaps due to the limited differentials in education attainment and household wealth status.

Reported recent partner conflicts were independently associated with antenatal depression. There is consistent international evidence that the quality of relationship between pregnant women and intimate partners is a determinant of mood. Mood disturbances have been associated with partner coercion (control, criticism and efforts to change her) (Fisher *et al*. 2007); domestic/intimate partner violence (Ferri *et al*., 2007; Flynn *et al*., 2007; Thananowan *et al*., 2008, Varma *et al*., 2007), and divorce and separation (Adewuya *et al*., 2007; Lovisi *et al*., 2005; Fatoye *et al*., 2004). Other assessed partner relationship measures were not associated with antenatal depression, though attenuation in the strength of univariate associations suggests some confounding with reported frequency of partner's use of alcohol, extent of practical help during the current pregnancy, current partner's fidelity and involvement in decisions related to household expenditures for health care. The lack of distress associated with perceived partner infidelity was difficult to explain. Partner fidelity concerns may have been under-reported, as women's questioning of a partner's fidelity in the study area is often discouraged (Lary *et al*, 2004). In addition, barriers to expressing and addressing partner fidelity concerns may normalize infidelity, and its expectation may minimize intensity of expected distress.

Finally, associations between early booking for antenatal care and depressive morbidity suggest pregnant and depressed women access allopathic services earlier, than non-depressed counterparts do. This reflects observations from the formative phase that showed in the cultural context symptoms equivalent to depressive morbidity were not perceived as distinct from other physical health and social concerns (Kaaya *et al*. *in press*). The fact participants reported symptoms to health care providers has important clinical implications for opportunities to improve recognition of depression.

Strengths of this study were in utility of proxy economic status and quality of partner relationship measures developed from a formative study. There are however some study limitations. Antenatal depressive episodes reportedly have a similar insidious onset and course as depression occurring in other periods of the life cycle. The study design did not allow for determination of duration since onset of assessed depressive symptoms, hence biases in recall of observed psychosocial risk factors are difficult to determine as existing depressive morbidity may selectively emphasize negative aspects of experiences. Assessment of depressive morbidity relied on a symptom-screening instrument. While a locally adapted, validated and calibrated tool to screen for depression in pregnancy can serve as a proxy measure of depressive disorder, prudence in interpreting the rates is advised as symptom screening tools overestimate depression rates (Bennet *et al*., 2004). Despite these limitations, the study provides hitherto little known information in the country that allows for some conclusions and recommendations for clinical practice.

The study findings provide support to earlier observations of high prevalence of depressive symptomatology equivalent to major depression during late pregnancy. Furthermore, when assessing pregnant women in this context, a history of previous depressive episodes or low satisfaction with ability to access basic needs, conflict in partner relationships and relatively earlier booking for antenatal care should alert practitioners to the possibility of depressive morbidity. Findings support a recommendation that antenatal services consider integrating screening for depression in routine antenatal care.

Acknowledgement

Authors thank study participants and research assistants, particularly Ms. Getrude Kessy. Institutional support from the Muhimbili University and funding support from the Canadian International Development and Research Council made these analyses possible.

REFERENCES

Aderibigbe, Y.A., Gureje, O., Omigbodun, O., (1993) Postnatal emotional disorders in Nigerian women. A study of antecedents and associations. *British Journal of Psychiatry,* 163:645-50.

Adewuya, A.O., Ola, B.A., Aloba, O.O., Dada, A.O., Fasoto, O.O., (2007) Prevalence and correlates of depression in late pregnancy among Nigerian women. *Depression and Anxiety,* 24(1):15-21

Altshuler, L.L., Hendrick, V., Cohen, L.S., (1998). Course of mood and anxiety disorders during pregnancy and the postpartum period. *Journal of Clinical Psychiatry,* 59 (Suppl. 2): 29-33

Andersson, L., Sundstrom-Poromaa, I., Wulff, M., Astrom, M., Bixo, M., (2004) Neonatal outcome following maternal antenatal depression and anxiety: a population-based study. *American Journal of Epidemiology,* 159(9):872-881

Baker, D., Taylor, H., (1997) The relationship between condition-specific morbidity, social support and material deprivation in pregnancy and early motherhood. ALSPAC Survey Team. Avon Longitudinal Study of Pregnancy and Childhood. *Social Science and Medicine,* 45(9):1325-36.

Bennet, H.A., Einarson, A., Taddion, A., Koren, G., Einarson, T.R., (2004) Prevalence of depression during pregnancy: systematic review. *Obstetrics and Gynaecology,* 103 (4): 698-709

Carter, F.A., Carter, J.D., Luty, S.E., Wilson, D.A., Frampton, C.M., & Joyce, P.R. (2005). Screening and treatment for depression during pregnancy: a cautionary note. *Australian and New Zealand Journal of Psychiatry,* 39(4), 255-261.

Chatterjee K.D., (1980) Parasitology (Protozology and Helminthology) in Relation to Clinical Medicine 12th edition. Chatterjee Medical Pub: Kolkata

Chen, H., Chan, Y.H., 3rd, Tan, K.H., & Lee, T. (2004). Depressive symptomatology in pregnancy—a Singaporean perspective. *Social Psychiatry and Psychiatry Epidemiology,* 39(12), 975-979.

Chung, T.K., Lau, T.K., Yip, A.S., Chiu, H.F., Lee, D.T., (2001) Antepartum depressive symptomatology is associated with adverse obstetric and neonatal outcomes. *Psychosomatic Medicine,* 63(5): 830

Faisal-Cury, A., Menezes, R.P., (2007) Prevalence of anxiety and depression during pregnancy in a private setting sample. *Archives of Women's Mental Health,* 10(1): 25-32

Farber, E.W., Herbert, S.E., Reviere, S.L., (1996) Childhood abuse and suicidality in obstetrics patients in a hospital-based urban prenatal clinic. *General Hospital Psychiatry*, 18(1):56-60.

Fatoye, F.O., Adeyemi, A.B., Oladimeji, B.Y., (2004) Emotional distress and its correlates among Nigerian women in late pregnancy. *Journal of Obstetrics and Gynaecology,* 24(5):504-509

Felice, E., Saliba, J., Grech, V., Cox, J., Calleja, N., (2007) Antenatal psychiatric morbidity in Maltese women. *General Hospital Psychiatry,* 29(6): 501-505

Ferri, C.P., Mitsuhiro, S.S., Barros, M.C., Chalem, E., Guinsburg, R., Patel, V., Prince M., Laranjeira, R., (2007) The impact of maternal experience of violence and common mental disorders on neonatal outcomes: a survey of adolescent mothers in Sao Paulo, Brazil *BMC Public Health,* 7: 209

Filmer, D., Pritchett, L.H., (2001) Estimating wealth effects without expenditure data—or tears: an application to educational enrolments in states of India. *Demography,* 38:115-32

Fisher, J.R., Tran, H.T., & Tran, T. (2007) Relative socioeconomic advantage and mood during advanced pregnancy in women in Vietnam. *International Journal of Mental Health Systems,* 1(1); 3

Flynn, H.A., Walton M.A., Chermack, S.T., Cunningham, R.M., Marcus, S.M., (2007) Brief detection and co-occurrence of violence, depression and alcohol risk in prenatal care settings. *Archives of Women's Mental Health,* 10(4):155-61

Gureje, O., Simon, G.E., Ustun, T.B., Goldberg, D.P., (1997) Somatisation in cross-cultural perspective: a World Health Organization study in primary care. *American Journal of Psychiatry*, 154(7):989-95.

Haas, J.S., Jackson, R.A., Fuentes-Afflick, E., Stewart, A.L., Dean, M.L., Brawarsky, P., Escobar, G.J., (2005) Changes in the health status of women during and after pregnancy. *Journal of General Internal Medicine*, 20(1):45-51.

Hart, R., & McMahon, C.A., (2006) Mood state and psychological adjustment to pregnancy. *Archives of Women's Mental Health,* 9(6), 329-337.

Hendrick, V., (1998) Evaluation of mental health and depression during pregnancy. *Psychopharmacology Bulletin,* 34(3): 297-299.

Hickey, C.A., Cliver, S., Goldenberg, R.L., McNeal, S.F., Hoffman, H.J., (1995) Relationship of psychosocial status to low prenatal weight gain among non-obese black and white women delivering at term *Obstetrics and Gynaecology,* 86(1): 177-183

Hoffman, S., Hatch, M., (2000) Depressive symptomatology during pregnancy: evidence for an association with decreased foetal growth in pregnancies of lower social class women. *Health Psychology,* 19(6): 535-543

Holzman, C., Eyster, J., Tiedje, L.B., Roman, L.A., Seagull, E., Rahbar, M.H., (2006) A life course perspective on depressive symptoms in mid-pregnancy. *Maternal and Child Health Journal,* 10(2):127-38

Hosmer, D.W., Lemeshow, S., 2000. *Applied Logistic Regression* (2nd ed.), New York: Wiley

Johanson, R., Chapman, G., Murray, D., Johnson, I., Cox, J., (2000) The North Staffordshire Maternity Hospital prospective study of pregnancy-associated depression. *Journal of Psychosomatic Obstetrics and Gynaecology*, 21(2): 93-97

Josefsson, A., Berg, G., Nordin, C., Sydsjö, G., (2001) Prevalence of depressive symptoms in late pregnancy and post-partum. *Acta Obstetricia Et Gynaecologica Scandinavica,* 80: 251-255

Kaaya, S.F., Mbwambo, J., Smith-Fawzi, M.C., van den Borne, B., Schaalma, H., Leshabari, (*in press)*. Understanding Experiences and Expressions of Distress in Women during Pregnancy in Chamazi Ward, Dar es Salaam, Tanzania. *Tanzania Journal of Health Research*

Kaaya, S.F., Smith-Fawzi, M.C., Mbwambo, J.K., Lee, B., Msamanga, G.I., Fawzi, W., (2002) The Kiswahili version of the Hopkins Symptom Checklist—25: Validity and calibration amongst HIV-positive antenatal clinic attendees in Dar es Salaam, Tanzania. *Acta Psychiatrica Scandinavica,* 106 (1):9-19

Kazi, A., Fatmi, Z., Hatcher, J., Kadir, M.M., Niaz, U., Wasserman G.A., (2006) Social environments and depression among pregnant women in urban areas of Pakistan: Importance of social relations. *Social Science and Medicine,* 63: 1466-1476.

Kitamura, T., Yoshida, K., Okano, T., Kinoshita, K., Hayashi, M., Toyoda, N., Ito, M., Kudo, N., Tada, K., Kanazawa, K., Sakumoto, K., Satoh, S., Furukawa, T., Nakano, H., (2006) Multicentre prospective study of perinatal depression in Japan: incidence and correlates of antenatal and postnatal depression. *Archives of Women's Mental Health,* 9(3):121

Koubovec, D., Geerts, L., Odendaal, H.J., Stein, D.J., Vythilingum, B., (2005) Effects of psychological stress on foetal development and pregnancy outcome. *Current Psychiatry Reports,* 7(4):274-80

Larsson, C., Sydsjö, G., Josefsson, A., (2004) A Health, sociodemographic data, and pregnancy outcomes in women with antepartum depressive symptoms. *Obstetrics and Gynaecology,* 104(3): 459-466

Lary, H., Maman, S., Katebalila, M., McCauley, A., Mbwambo, J., (2004) Exploring the association between HIV and violence: young people's experiences with infidelity, violence and forced sex in Dar es Salaam, Tanzania. *International Family Planning Perspectives* 30(4): 200-206

Lee, B., Kaaya, S.F., Mbwambo, J.K., Smith-Fawzi, M.C., Leshabari, M.T., (2008) Detecting depressive disorder with the Hopkins Symptom Checklist-25 in Tanzania. *International Journal of Social Psychiatry*, 54(1):7-20.

Limlomwongse, N., Liabsuetrakul, T., (2006) Cohort study of depressive moods in Thai women during late pregnancy and 6-8 weeks of postpartum using the Edinburgh Postnatal Depression Scale (EPDS). *Archives of Women's Mental Health*, 9(3):131-8

Lovisi, G.M., Lopez, J.R., Coutinho, E.S., Patel, V., (2005) Poverty, violence and depression during pregnancy: a survey of mothers attending a public hospital in Brazil. *Psychological Medicine,* 35(10): 1485-92

Marcus, S.M., Flynn, H.A., Blow, F.C., Barry, K.L., (2003) Depressive symptoms among pregnant women screened in obstetrics settings. *Journal of Women's Health,* 12(4): 373-80

Massawe, S.N., Urassa, E.N., Mmari, M., Ronquist, G., Lindmark, G., Nystrom, L., (1999) The complexity of pregnancy anaemia in Dar-es-Salaam. *Gynaecologic and Obstetric Investigation*, 47(2): 76-82

Murray, L., Cooper, P.J., Stein, A., (2001) Postnatal depression and infant development. *British Medical Journal,* 302(6783): 978-979

Nganda, R.Y., Drakeley, C., Reyburn, H., Marchant, T., (2004) Knowledge of malaria influences the use of insecticide treated nets but not intermittent presumptive treatment by pregnant women in Tanzania. *Malaria Journal,* 3:42

Nhiwatiwa, S., Patel, V., Acuda, W., (1998) Predicting postnatal mental disorder with a screening questionnaire: a prospective cohort study from Zimbabwe. *Journal of Epidemiology and Community Health;* 52: 262-266

Pajulo, M., Savonlahti, E., Sourander, A., Helenius, H., Piha, J., (2001) Antenatal depression, substance dependency and social support. *Journal of Affective Disorders,* 65(1): 9-17

Patel, V., (1998) Culture and Common Mental Disorders in Sub-Saharan Africa. *Maudsley Monographs* 41, East Sussex: Psychology Press.

Patel, V., Prince, M., (2006) Maternal psychological morbidity and low birth weight in India. *British Journal of Psychiatry,* 188(3): 284-285

Perkin, M.R., Bland, J.M., Peacock, J.L., (1993) The effect of anxiety and depression during pregnancy on obstetric complications. *British Journal of Obstetrics and Gynaecology,* 100(7): 629-634

Rahman, A., Bunn, J., Lovel, H., Creed, F., (2007) Association between antenatal depression and low birth weight in a developing country. *Acta Psychiatrica Scandinavica,* 115(6):481-6.

Rahman, A., Iqbal, Z., Bunn, J., Lovel, H., Harrington R., (2004) Impact of maternal depression on infant nutritional status and illness. *Archives of General Psychiatry,* 61: 946-952

Records, K., Rice, M., (2007) Psychosocial correlates of depression symptoms during the third trimester of pregnancy. *Journal of Obstetric Gynaecologic and Neonatal Nurses,* 36(3):231-242

Rich-Edwards, J.W., Kleinman, K., Abrams, A., Harlow, B.L., McLaughlin, T.J., Joffe, H., & Gillman, M.W. (2006). Sociodemographic predictors of antenatal and postpartum depressive symptoms among women in a medical group practice. *Journal of Epidemiology and Community Health,* 60(3), 221-227.

Rini, CK., Dunkel-Schetter, C., Wadhwa, P., Sandman, C., (1999) Psychological adaptation and birth outcomes: the role of personal resources, stress and socio-cultural context in pregnancy. *Health Psychology,* 18(4): 333-345

Rochat, T.J., Richter, L.M., Doll, H.A., Buthelezi, N.P., (2008) Depression amongst pregnant rural South African women undergoing HIV testing. *Journal of The American Medical Association,* 295(12):1376-1378

Rondó, P.H.C., Ferreira, R.F., Nogueira, F., Ribeiro, M.C.N., Lobert, N., Artes, R., (2003) Maternal psychological stress and distress as predictors of low birth weight, prematurity and intrauterine growth retardation. *European Journal of Clinical Nutrition,* 57(2): 266-272

Ross, L.E., Sellers, E.M., Gilbert Evans, S.E., & Romach, M.K., (2004) Mood changes during pregnancy and the postpartum period: development of a biopsychosocial model. *Acta Psychiatrica Scandinavica*, 109(6), 457-466.

Rost, K., Burnam, M.A., Smith, G.R., (1993) Development of screeners for depressive disorders and substance abuse history. *Medical Care* 31(3):189-200.

Salokangas, R.K., Poutanen, O., (1998) Risk factors for depression in primary care. Findings of the TADEP project. *Journal of Affective Disorders,* 48 (2-3): 171-80

Thananowan, N., Heidrich, S.M., (2008) Intimate partner violence among pregnant Thai women. *Violence against Women,* 14(5): 509-27

Varma, D.C., Prabha, S., Thomas, T., Carey, M.P., (2007) Intimate partner violence and sexual coercion among pregnant women in India: Relationship with depression and post-traumatic stress disorder. *Journal of Affective Disorders,* 102(1-3): 227-235

Whyte, SR., (1991) Attitudes towards mental health problems in Tanzania. *Acta Psychiatrica Scandinavica,* (Suppl.) 364:s59-76

Wissart, J., Parshad, O., & Kulkarni, S. (2005). Prevalence of pre- and postpartum depression in Jamaican women. *BMC Pregnancy Childbirth*, 5, 15.

Chapter Six

Depressive symptoms increase risk of HIV disease progression and mortality among women in Tanzania

Manuscript published as: Antelman G, Kaaya S, Wei R, Mbwambo J, Msamanga GI, Fawzi WW, Fawzi MC. (2007) Depressive symptoms increase risk of HIV disease progression and mortality among women in Tanzania. *Journal of Acquired Immune Deficiency Syndrome,* 1; 44(4):470-7.

ABSTRACT

The effect of depression on HIV disease progression was examined among 996 HIV-positive Tanzanian women participating in a trial on micronutrients and pregnancy outcomes, vertical transmission and disease progression. Depression and social support were measured two months after HIV screening, and every 6-12 months thereafter. Depression measures from pregnancy and more than 12 months post-partum were included in this analysis. Participants' clinical condition and access to supportive individual and/or group counselling was assessed throughout the 6-8 years of follow-up. Cox proportional hazard models were used to estimate the time-varying effect of depression on progression to HIV stage III/IV (World Health Organization) and all-cause mortality. Participation in group and/or individual counselling, and baseline social support was also examined. More than half (57%) of the study sample had symptoms comparable with depression at least once during the follow-up period. Controlling for socio-demographic variables, psychosocial support, and clinical condition at enrolment, depression was associated with an increased risk of disease progression (HIV clinical stage III/IV [HR=1.61, 95% CI: 1.28, 2.03] and mortality [HR=2.65, 95% CI: 1.89, 3.71]). Depression is common among HIV-infected Tanzanian women and increases the risk of disease progression. Screening for depression and providing psychosocial interventions should be considered part of comprehensive HIV care.

INTRODUCTION

More than 60% of the world's HIV-infected population lives in sub-Saharan Africa, and more than 70% of all deaths due to HIV and AIDS are in this region. Although the rate of new infections seems to be stabilizing in many African countries, the absolute number of people living with HIV and AIDS is growing. Women are disproportionately affected by the disease representing 59% of all people living with HIV in sub-Saharan Africa and this trend seems to be worsening: recent survey data have shown that young women (15-24) are three times more likely to be HIV infected than men in the same age group (UNAIDS, 2006). Increasing access to antiretroviral treatment has been an important and urgent focus of HIV care programs, and has led to renewed efforts to increase access to HIV testing (De Cock *et al.*, 2003). As more people learn their status and in recognition of the long latent period of disease before ARVs are required, factors related to HIV disease progression remain important to identify in order to design comprehensive HIV care services which meet the needs of people living with HIV.

A growing body of evidence linking psychosocial factors to immune suppression suggests that depression or stress may accelerate HIV disease progression (Kopnisky

et al., 2004; Leserman, 2003; Glaser *et al*., 1999; Weisse *et al*., 1992). Depression may alter immune function through a variety of mechanisms, including reductions in killer lymphocyte cells (Evans *et al*., 1995; Murphy *et al*., 1987), alterations in serotonin [Jackson *et al*., 1985) and nor epinephrine function (Irwin *et al*., 1987), which may be related to impaired neuroendocrine function (Black *et al*., 1994). Depression may also be indirectly related to disease progression through behavioural mechanisms, such as non-adherence to medical recommendations (Ammassari *et al*., 2002; Ickovics *et al*., 2002) or reduced caloric intake resulting in wasting (Coodley *et al*., 1994; Coodley *et al*., 1994b).

The prevalence of psychiatric disorders among HIV-infected women in sub-Saharan Africa is not well documented, but high rates of depressive symptoms have been reported among HIV-infected women in the U.S. [Cook *et al*., 2004), and a recent study of HIV-infected men and women in Uganda showed that 47% reported depressive symptoms (Kaharuza *et al*., 2006). Similarly, approximately one-third of HIV-infected women studied in Rwanda experienced depressed mood, difficulties with sleep, and problems with performing their daily tasks. HIV-related concerns included worrying about relatives providing help with problems related to the disease, fear that a partner would not be supportive, fear of not having resources for their family's basic needs, and future care for their children (Keogh *et al*., 1994).

Many studies on depression and HIV have found an association between depressive symptoms and immunological parameters of disease progression (Kaharuza *et al*., 2006; Lykestos *et al*., 1993; Perry *et al*., 1992) or HIV-related symptoms (Jones *et al*., 2001; Zorrilla *et al*., 1996), but studies examining the relationship longitudinally have produced conflicting results. Some have found no evidence that depression predicts increased progression of disease or mortality (Lykestos *et al*., 1993; Rabkin *et al*., 1991), while others report that depression predicts a more rapid decline of CD4 lymphocyte counts (Burack *et al*., 1993) and shorter time to AIDS (Golub *et al*., 2003). Two studies among large cohorts of HIV-infected U.S. women have shown that chronic depressive symptoms were associated with an increased risk of mortality (Leserman, 2003; Ickovics *et al*., 2001).

A recent review of the role of psychological variables on progression of HIV-1 concluded that strong evidence supported the biological plausibility of the relationship between depression and disease progression (Kopnisky *et al*., 2004), but this has not been reliably shown in studies. The absence of consistent findings may be explained by the relatively small contribution of psychosocial factors to progression compared to the protective effect of HAART. In addition, there is currently very limited data on this relationship from the developing world and no studies to date have examined this association prospectively in a developing country setting The purpose of this study is to examine the burden of depressive symptoms among HIV-positive women in Tanzania and estimate the association between those symptoms

and HIV disease progression among a cohort of HIV-infected pregnant women followed up to eight years.

MATERIALS AND METHODS

This study was conducted within a randomized controlled trial on the effect of vitamin supplementation on pregnancy outcomes, vertical HIV transmission and HIV disease progression. Women were offered HIV testing and were recruited into the trial from April 1995 to July 1997 at selected antenatal clinics in Dar es Salaam, Tanzania (Fawzi *et al*., 1999). Of the nearly 14,000 pregnant women who consented to HIV counselling and testing, 1819 were found to be HIV-infected (13%), and 1078 were enrolled in the trial and followed monthly until June 2003. Primary endpoints of the parent study included vertical transmission rates, pregnancy outcomes, HIV disease progression and mortality among enrolled women and their children born into the study. Women with at least one depression measure taken during pregnancy, or more than 12 months postpartum were eligible for inclusion in this study (n=996). Data from depression assessments done between delivery and 12 months postpartum were deleted from the dataset to eliminate any potential bias due to postpartum depression.

Women were followed monthly, and later quarterly, until the study ended in 2003, about six to eight years after their HIV diagnosis. At screening, baseline data on gestational age, maternal age, education, and occupation were collected on all women who consented to HIV testing. A medical history, clinical exam and CD4 cell count (FACScount, Becton-Dickinson, San Jose, CA) were obtained at enrolment. Stage of HIV disease was defined according to WHO criteria (WHO, 1993), using an algorithm based on a clinical examination and history of illness during the previous month. Women attended the clinic monthly for physical examinations until 2000 when they were clinically assessed every three months. Survival/mortality data were collected through tracing participants if a clinic visit was missed. Women were classified as alive as of the date of contact if a home visitor reported that she spoke with, or saw the participant at that time.

Approximately two months after enrolment, every six months until 2001, and every 12 months thereafter, a psychosocial questionnaire was administered to assess depression/anxiety symptoms (Derogatis *et al*., 1974). The Hopkins Symptom Checklist (HSCL-25), designed to assess anxiety and depressive symptoms, includes a 10-item anxiety scale and a 15-item depression scale (Hesbacher *et al*., 1980). Based on a validation study of the HSCL-25 in this population, Kaaya *et al*. (2002) reported that a subscale of only 8 items, with a recalibrated cut-off score for 'caseness' at >1.06, showed high sensitivity (88%) and specificity (89%) in identifying clinical depression as determined by an interview with a psychiatrist using the Structured

Clinical Interview for the DSM-IV to assess major depressive disorder (Kaaya *et al*., 2002). Therefore, depression was defined for this study using only eight items from the 25 item scale and the revised cut-off score (Appendix).

The social support scale, based on the Duke-UNC Functional Social Support Questionnaire (Broadhead *et al*., 1988), was designed to measure functional dimensions of social support among patients in a primary care setting. A 10-item questionnaire derived from this scale reflects emotional/affective support and material/instrumental support (Appendix). Both the depression and social support scales were translated into Kiswahili by a committee, and verified through independent back-translation.

Women were invited to come to the study clinic between scheduled examinations if they were ill, or for individual or group counselling. A psychiatric nurse provided individual counselling and facilitated a weekly support group. Counselling efforts were targeted to women who requested counselling, women who were referred from a research nurse or physician, or women who reported depressive/anxiety symptoms at semi-annual psychosocial assessments. The support group was open to all study participants. The group focused on health maintenance, family support, safe HIV-serostatus disclosure, and HIV prevention. The emphasis of the group was on peer support.

Cox proportional hazard regression models (SAS/STAT, Version 8e, SAS Institute, Cary, NC) were used to examine the relative hazard of depression, baseline social support, and counselling interventions on HIV disease progression and mortality (Cox, 1972). Depression was allowed to vary over time intervals using the Andersen-Gill Model (PROC PHREG). HIV disease progression was defined clinically as progression to WHO clinical stage III or IV; and mortality. Covariates included baseline socio-demographic variables (age, parity, education, occupation), and clinical condition at enrolment measured by WHO stage of disease and CD4 cell count (<200; 200-499; > 500 copies/µL).

Using the validated 8-item depression scale described above, women were classified as 'depressed' if they scored above the cut-off mean score of 1.06 for depressive symptoms at any time after enrolment. Depression was treated as time-varying independent predictor in models predicting clinical disease progression and mortality. Participation in the peer support group or receiving individual counselling was defined as either 'some' or 'none', only using measures taken before censorship. Level of social support was measured at the first psychosocial assessment about two months after enrolment. Women were classified as having low baseline social support if their scores reflected the lowest 10th percentile of the social support scale scores.

Women were censored from the mortality analysis at the date of last contact in the clinic or through a home visit. Censorship from the staging analysis was at the last assessment of clinical stage. Women who were at stage III at their enrolment

clinical exam were not included in the staging analysis (women at stage IV were not eligible for the study). Depression measures taken on the day of censorship or later were not included in the analysis. The time intervals were defined at 12 months. The College Research and Publications Committee of Muhimbili University College of Health Sciences, the Ethical Committee of the National AIDS Control Program of the Tanzanian Ministry of Health, and the Human Subjects Committee of the Harvard School of Public Health approved the study.

RESULTS

A total of 996 women (out of the 1,078 enrolled in the larger trial) were eligible for inclusion in this analysis. Table 1 compares the characteristics of the 996 women eligible for inclusion in the analysis with those of the 823 women who screened HIV-positive but were not included in the analysis. Most of these women were not enrolled in the parent study (n=741).

Table 1: Description of the study cohort compared with women who screened HIV-positive but were not included in the study analysis

	Included in analysis (n=996)		**Not included in analysis (n=823)**		
	N	**%**	**N**	**%**	**p-value [1]**
Age in years					0.77
< 20	125	12.5	96	11.7	
20—24	402	40.4	349	42.4	
25—29	305	30.6	252	30.6	
≥ 30	164	16.5	126	15.3	
Education					0.27
none or ≤ 4 yrs	133	13.4	92	11.2	
5—8 yrs	760	76.3	634	77.0	
≥ 9 yrs	103	10.3	97	11.8	
Occupation[1]					0.003
No outside employment	726	72.9	582	70.7	
Professional	27	2.7	10	1.2	
Business	139	14.0	161	19.6	
Office	41	4.1	26	3.2	
Hotel / Restaurant / other	63	6.3	44	5.3	
Marital status					0.136
Married monogamously	582	58.4	481	58.4	
Married polygamous	55	5.5	62	7.5	
Cohabiting	247	24.8	177	21.5	
Single	112	11.2	103	12.5	

Key: [1] The frequency distributions were compared using the chi-square test -

The remaining women were not included in the analysis because they did not contribute a single depression measure (n=62) due to moving out of the study area, withdrawal, or death, or because they had depression measures only from the postpartum period (n=20). There were no statistically significant differences between the two groups in the mean or frequency distributions of age, education, or marital status. The distribution of occupations among women who were included in this analysis compared to those excluded was significantly different (p=0.003, Table 1). Women included in the analysis were less likely to be employed in business. The mean age of the women in the sample was 25 years, and mean gestational age at HIV screening was 18 weeks (median=19, range 8-24). A large proportion (37%) of the women could be classified as having poor economic and food security according to their daily per capita expenditure on food (less than US$ 0.75). Approximately three-quarters (76%) of the women completed 5-8 years of formal education, 73% were not employed outside the home and nearly 90% were either married or in a cohabiting relationship (Table 1).

Table 2: Description of key measures of depression, psychosocial support, and clinical status for the study cohort (N=996)

Depression and social support	N	%	Clinical status	N	%
Depression					
None	430	43.2			
At least once	566	56.8			
Depression by follow-up time period			Clinical WHO stage at enrolment		
Antepartum	380	42.7	WHO stage I	815	81.8
Long-term follow-up (≥ 12 months postpartum)	343	45.3	WHO stage II	171	17.2
			WHO stage III	10	1.0
Persistence of depression [1]			CD4 count at enrolment (µL) [3]		
Not depressed at either time	224	34.3	<200	117	12.4
Depressed at one time period	271	41.6	200-499	536	56.8
Depressed both time periods	157	24.1	≥ 500	291	30.8
Social Support[2]			Counselling / Group attendance		
Low (<10th percentile score)	117	12.0	None	623	62.6
Moderate (10-50th percentile)	382	39.2	At least once	373	37.4
High (>50th percentile score)	476	48.8			

Key: [1] Only 652 women with observations during pregnancy and more than 12 months postpartum were included; [2] n=975 women with social support measures at enrolment; n=21 had missing values; [3] n=944 women with CD4 count measures at enrolment, n=52 had missing values.

At enrolment 82% of the women were classified with WHO clinical stage I disease, 17% were classified with WHO stage II disease, only 1% were classified with WHO stage III disease. More than half (57%) had CD4 cell counts between 200-499 cells/µL; 12% CD4 counts less than 200 cells/µL and 31% had CD4 counts of 500

cells/µL or greater (Table 2). The 996 HIV-infected women with at least one eligible measure of depression were followed for a median of 72 months, or 6 years (mean = 61 months; range from 2 to 98 months). The women completed a median of five depression assessments (mean = 5.1; range 1-14). Nearly 57% (n=566) scored above the cut-off for depression at least once during follow-up.

Nearly 20% of the women attended at least one group support session (median = 6 sessions; range 1-68), and approximately 29% received individual counselling from a social worker (median = 5 sessions; range 1-45; results not shown). The 'counselling/group support' variable was defined as any participation in a support group or individual counselling (37%; Table 2). Because all study women had recently been told their HIV-seropositive status, we examined the prevalence of depressive symptoms at baseline, which was 2.5 months after post-test counselling and found that nearly 43% (n=380) of the 891 women with antenatal assessments were depressed at baseline. A similar proportion (45%) was depressed during follow-up at least 12 months after delivery. Among those who were ever-depressed, more than one-third (37%) of the women scored greater than the cut-off for depression in both periods: antepartum and more than 12 months after delivery (Table 2). A total of 312 (31%) women died during follow-up.

Progression to World Health Organization Stage III/IV Disease

Depression was associated with greater than 60% increased risk of being diagnosed in WHO stage III/IV (hazard ratio [HR] = 1.61, 95% confidence interval [CI]: 1.28 to 2.03; Table 3). Univariate and multivariate estimates of this risk were similar, indicating limited confounding due to baseline clinical stage or CD4 count. Counselling or group attendance and low social support at baseline were not significantly associated with disease progression nor did their inclusion in the model affect the relationship between depression and clinical progression. Low education was significantly associated with disease progression (<5 years: HR=1.68, 95% CI: 1.10 to 2.58; 5-8 years: HR=1.43, 95% CI: 1.02 to 2.01). Women working in offices seemed to be at increased risk (HR=1.63, 95% CI: 1.02 to 2.58). Women working as professionals were at significantly lower risk of clinical progression (HR=0.45, 95% CI: 0.22 to 0.92; see Table 3). Immunological status at enrolment was independently significantly associated with clinical progression during follow-up. Women who entered the cohort with a CD4 count below 200 cells/µL, were more than twice as likely to progress clinically compared to women with CD4 counts greater than 500 cells/µL (HR=2.47, 95% CI: 1.77 to 3.46), and women with moderately low CD4 counts between 200 and 500 cells/µL were 42% more likely to progress clinically (HR=1.42, 95% CI: 1.14 to 1.79).

Table 3: Depression, counselling / support group attendance, and social support as predictors of progression to WHO stage III/IV HIV disease in univariate and multivariate analyses, n=893[1]

	Univariate relative hazard (95% C.I.)	**P-value**	**Multivariate relative hazard I (95% C.I.)**	**P-value**	**Multivariate relative hazard II (95% C.I.)**	**P-value**
Depression	1.57 (1.26, 1.97)	<0.0001	1.55 (1.23, 1.95)	0.0002	1.61 (1.28, 2.03)	<0.0001
Individual counselling/peer group	—	—				
Never			1.00	0.700	1.00	0.825
At least once			0.96 (0.79, 1.17)		1.02 (0.84, 1.25)	
Baseline social support	—	—				
Low (<10th percentile)			1.22 (0.82, 1.81)	0.332	1.11 (0.74, 1.66)	0.604
Not low			1.00		1.00	
CD4+ lymphocyte count (µL) at enrolment	—	—	—	—		
<200					2.47 (1.77, 3.46)	<0.0001
200-499					1.42 (1.14, 1.79)	0.002
500+					1.00	
Educations (yrs)	—	—	—	—		
none / less than 5					1.68 (1.10, 2.58)	0.017
5—8					1.43 (1.02, 2.01)	0.039
9+					1.00	
Occupation	—	—	—	—		
None outside the home					1.00	0.039
Office					1.63 (1.02, 2.58)	0.692
Business					1.06 (0.81, 1.38)	0.028
Professional					0.45 (0.22, 0.92)	0.993
Restaurant / Hotel					1.00 (0.47, 2.12)	0.294
Other					0.77 (0.48, 1.25)	

Key: [1] Of 996 women with depression measures, n=893 were eligible for this analysis. Reasons for elimination included: n=16 did not have a clinical stage outcome defined, and n=87 only had depression measures taken on or later than the date of censorship.

Table 4: Depression, counseling/support group attendance, and social support as predictors of progression to mortality in univariate and multivariate analyses, n = 996*

	Univariate Relative Hazard (95% CI)	P –value	Multivariate Relative Hazard I (95% CI)	P-value	Multivariate Relative Hazard II (95% CI)	P-value
Depression	2.41 (1.75 to 3.31)	<0.0001	2.59 (1.85 to 3.62)	<0.0001	2.65 (1.89 to 3.72)	<0.0001
Individual counseling/peer group	——	—-				
Never			1.00	0.228	1.00	0.313
At least once			0.83 (0.61 to 1.13)		0.85 (0.62 to 1.16)	
Baseline social support	—-	—-				
Low (<10th percentile)			0.88 (0.49 to 1.58)	0.680	0.93 (0.52 to 1.67)	0.810
Not low			1.00		1.00	
CD4+ lymphocyte count (mL) at enrollment						
200					9.04 (5.23 to 15.62)	<0.0001
200-499					3.13 (1.89 to 5.18)	<0.0001
500+					1.00	
Occupation						
None outside the home					1.00	0.070
Office					1.84 (0.95 to 3.54)	0.712
Business					1.08 (0.71 to 1.64)	0.061
Professional					0.26 (0.06 to 1.06)	0.184
Restaurant / Hotel					1.84 (0.75 to 4.52)	0.135
Other					1.64 (0.86 to 3.15)	

*All women with at least 1 depression measure from before delivery or more than 12 months postpartum were eligible for this analysis (n = 996).

Depression and survival

In models predicting all-cause mortality, depression was associated with more than a two-fold significant increased risk of death (HR 2.65, 95% CI: 1.89 to 3.71), and this relation was independent of baseline stage of disease and CD4 count (Table 4). The lack of association between counselling or support group attendance and low social support persisted. Similar, but only marginally statistically significant effects associated with occupation were observed (office work HR=1.84, 95% CI: 0.95 to 3.54; professional work HR=0.26, 95% CI: 0.06 to 1.06). No effect of education was observed, so the variable was not included in the final multivariate model. Immunological status at baseline was strongly associated with mortality (CD4 < 200 cells/µL: HR=9.04, 95% CI: 5.23 to 15.62; CD4 200-499 cells/µL: HR=3.13, 95% CI: 1.89 to 5.18).

DISCUSSION

This study is among the first to examine the role of depression on clinical disease progression and mortality among HIV-infected women in sub-Saharan Africa. We found a high prevalence of depressive symptoms (43%) among predominantly asymptomatic HIV-infected pregnant women soon after they had learned about their HIV status, and the majority (57%) reported depression at least once during pregnancy or the study follow-up period defined as more than 12 months postpartum. These prevalence estimates of depression among Tanzanian women are remarkably similar to a U.S. cohort of HIV-infected women [16], and consistent with a cross-sectional assessment of depression and HIV among men and women in Uganda (Kaharuza *et al*., 2006).

After adjusting for clinical or immunological predictors and socio-demographic correlates of disease progression, depressive symptoms among HIV-infected women were associated with significant increased risk of clinical disease progression to WHO stages III/IV. Depression also was predictive of over a two-fold increased risk of death. These findings support the hypothesis that depression is an independent predictor of HIV disease progression and mortality among HIV-infected women.

The effect of low social support at baseline did not modify the effect of depression on disease progression and mortality and had no independent effect on the outcomes of interest. Counselling and/or support group attendance also was not associated with the outcomes of interest. This finding may be due to the fact that the study was not designed to define and test the effects of a psychosocial intervention on disease progression. Study staff actively referred women they identified to be at high psychosocial risk to these services, but the services remained open to all study women. As a result, the group of women who received such services was likely to contain many self-selected women who actively sought to improve their psychoso-

cial status, as women who were depressed and reported low social support, and/or stressful life situations.

Although this study did not identify positive effects of counselling on disease progression or mortality, there is a need for additional studies specifically designed to measure the effectiveness of different psychosocial interventions. Few studies have quantitatively examined psychosocial interventions in developing countries (Kelly *et al*., 1993). One exception is a recent study conducted in Uganda that reported very high rates of recovery among depressed individuals after participation in a community-based 16-week program of group interpersonal therapy (Bolton *et al*., 2003). Another randomized trial in Tanzania is currently assessing the effectiveness of 6-weekly closed group support sessions for recently enrolled women into a prevention of mother-to-child transmission (PMTCT) program [Kaaya, personal communication, 2006].

This study has demonstrated that a simple 8-item screening tool can reliably identify women who are depressed and at risk of HIV disease progression. Because this is the first application of the shorter scale, we also ran univariate analyses defining depression according to the standard (Western-validated) cut-off of 1.75 on all 25 items of the scale. Results were consistent with the results when depression was defined using the 8-item scale cut-off score calibrated to this population (progression to stage III+: HR 1.97, 95% CI: 1.23 to 3.16; mortality: HR = 3.48, 95% CI: 1.99 to 6.09). These consistent findings strongly support the validity of the shorter scale as a screening tool for measuring depressive symptoms in this population and the observed effects of depression on HIV disease progression and mortality

Examining the role of psychosocial factors on disease progression among women of reproductive age has immediate public health and public policy implications. Initiatives to scale-up HIV screening of pregnant women to prevent vertical transmission of HIV are underway in Tanzania and many other countries (De Cock *et al*., 2003; Guay *et al*., 1999; Dabis & Ekpini, 2002). As a result, an increasing number of women of childbearing age are learning that they are HIV-infected, and are usually in early stages of disease when tested. They may participate in, and benefit from, programs to prevent HIV transmission to their infant. But they must also face the stressful task of coping with the knowledge of their HIV status and linking into long term-term comprehensive care (Gaillard *et al*., 2002). These women face substantial sources of stress, potentially leading to depression, such as the stigmatization of people living with HIV, disclosure, limited access to care, discontinuity of care, poor economic/food security, making difficult choices about infant feeding, and worrying about whether their child is going to be infected or not.

Public health interventions that identify and treat depression could slow progression to AIDS and may potentially lower the overall psychosocial burden and suffering caused by HIV. These findings also have implications for recent initiatives to provide broader access to antiretroviral (ARV) medications in resource-poor set-

tings. Interventions that can slow the progression of HIV delay the use of ARVs and may allow programs to treat more patients as well as improve the overall quality of life for HIV-infected patients.

Still, our findings also pose significant challenges to PMTCT and other HIV care and support programs. How can such programs design, budget for and provide effective interventions to identify and manage depression within resource poor public health systems? In this study, although support group meetings were open to all study participants, fewer than 1 in 5 women attended and only 1 in 4 depressed women sought the services of individual counselling. Thus, despite the availability of such interventions, and the fact that high risk women were actively referred to them, levels of participation remained low. Barriers could simply be logistic, related to the timing of group and individual support sessions, quality and/or privacy of the counselling space, or transport costs. Nevertheless, concerns about confidentiality, fear of HIV serostatus disclosure, and stigmatization may also inhibit full participation in counselling or peer-support interventions among HIV-infected women.

Effective interventions for managing depressive symptoms urgently need to be identified and tested in appropriately designed trials targeting populations heavily burdened by HIV. Barriers to participation in psychosocial support mechanisms also need to be further investigated and addressed through operational research and programmatic experience.

Acknowledgements

The authors gratefully acknowledge the women who participated in the study, the research assistants, and staff at Muhimbili National Hospital, the Muhimbili University College of Health Sciences, and City of Dar es Salaam Health Department for their support. Special thanks are extended to Illuminata Ballonzi, Juliana Mghamba, Gertrude Kessy, Izera Marko and Dr. Heavington Mshiu.

REFERENCES

Ammassari, A., Trotta, M.P., Murri, R., Castelli, F., Narciso, P., Noto, P., Vecchiet, J., D'Arminio Monforte, A., Wu, A.W., & Antinori, A. (2002). Correlates and predictors of adherence to highly active antiretroviral therapy: overview of published literature. *Journal of Acquired Immune Deficiency Syndrome*, 31 Suppl 3, S123-127.

Black, P.H. (1994). Immune system-central nervous system interactions: effect and immunomodulatory consequences of immune system mediators on the brain. *Antimicrobial Agents and Chemotherapy*, 38(1), 7-12.

Bolton, P., Bass, J., Neugebauer, R., Verdeli, H., Clougherty, K.F., Wickramaratne, P., Speelman, L., Ndogoni, L., & Weissman, M. (2003). Group interpersonal psychotherapy for depression in rural Uganda: a randomized controlled trial. *Journal of the American Medical Association*, 289(23), 3117-3124.

Broadhead, W.E., Gehlbach, S.H., Degruy F.V., Kaplan B.H. (1988) The Duke-UNC Functional Social Support Questionnaire. *Medical Care*, 26(7):709-23

Burack, J.H., Barrett, D.C., Stall, R.D., Chesney, M.A., Ekstrand, M.L., & Coates, T.J. (1993). Depressive symptoms and CD4 lymphocyte decline among HIV-infected men. *Journal of the American Medical Association*, 270(21), 2568-2573.

Coodley, G.O., Loveless, M.O., & Merrill, T.M. (1994b). The HIV wasting syndrome: a review. *Journal of Acquired Immune Deficiency Syndrome*, 7(7), 681-694.

Coodley, G.O., Loveless, M.O., Nelson, H.D., & Coodley, M.K. (1994). Endocrine function in the HIV wasting syndrome. *Journal of Acquired Immune Deficiency Syndrome,* 7(1), 46-51.

Cook, J.A., Grey, D., Burke, J., Cohen, M.H., Gurtman, A.C., Richardson, J.L., Wilson, T.E., Young, M.A., & Hessol, N.A. (2004). Depressive symptoms and AIDS-related mortality among a multisite cohort of HIV-positive women. *American Journal of Public Health*, 94(7), 1133-1140..

Cox, D.R., (1972) Regression models and life-tables. *Journal of the Royal Statistical Society,* 26B, 103-110.

Dabis, F., Ekpini E.R. (2002) HIV-1/AIDS and maternal and child health in Africa. *Lancet*, 359 (9323):2097-2104.

De Cock, K.M., Marum, E., Mbori-Ngacha, M. (2003) A serostatus-based approach to HIV/AIDS prevention and care in Africa. *Lancet,* 362 (9398):1847-1849.

Derogatis, L.R., Lipman, R.S., Rickels, K., Uhlenhuth, E.H., Covi, L. (1974). The Hopkins Symptom Checklist (HSCL): a self-report symptom inventory. *Behavioral Science*, 19(1), 1-15.

Evans, D.L., Leserman, J., Perkins, D.O., Stern, R.A., Murphy, C., Tamul, K., Liao, D., van der Horst, C.M., Hall, C.D., Folds, J.D., & *et al*. (1995). Stress-associated reductions of cytotoxic T lymphocytes and natural killer cells in asymptomatic HIV infection. *American Journal of Psychiatry*, 152(4), 543-550.

Fawzi, W.W., Msamanga G.I., Spigelman, D., Urassa, E.J., Hunter, D.J. (1999) Rationale and design of the Tanzania Vitamin and HIV infection trial. *Controlled Clinical Trials,* 20(1): 75-90

First, M.B., Gibbon, M., Spitzer, R.L., Williams, J. (1995) *Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I), Research Version 2.0* (Draft). NY: State Psychiatric Institute, NY.

Gaillard, P., Melis, R., Mwanyumba, F., Claeys, P., Muigai, E., Mandaliya, K., Bwayo, J., & Temmerman, M. (2002). Vulnerability of women in an African setting: lessons for mother-to-child HIV transmission prevention programmes. *AIDS*, 16(6), 937-939.

Glaser, R., Rabin, B., Chesney, M., Cohen, S., & Natelson, B. (1999). Stress-induced immunomodulation: implications for infectious diseases? *Journal of the American Medical Association*, 281(24), 2268-2270.

Golub, E.T., Astemborski, J.A., Hoover, D.R., Anthony, J.C., Vlahov, D., & Strathdee, S.A. (2003). Psychological distress and progression to AIDS in a cohort of injection drug users. *Journal of Acquired Immune Deficiency Syndrome*, 32(4), 429-434

Guay, L.A., Musoke, P., Fleming, T., Bagenda, D., Allen, M., Nakabiito, C., Sherman, J., Bakaki, P., Ducar, C., Deseyve, M., Emel, L., Mirochnick, M., Fowler, M.G., Mofenson, L., Miotti, P., Dransfield, K., Bray, D., Mmiro, F., & Jackson, J.B. (1999). Intrapartum and neonatal single-dose nevirapine compared with zidovudine for prevention of mother-to-child transmission of HIV-1 in Kampala, Uganda: HIV-NET 012 randomised trial. *Lancet*, 354(9181), 795-802.

Hesbacher, P.T., Rickels, K., Morris, R.J., Newman, H., & Rosenfeld, H. (1980). Psychiatric illness in family practice. *Journal of Clinical Psychiatry*, 41(1), 6-10.

Ickovics, J.R., Hamburger, M.E., Vlahov, D., Schoenbaum, E.E., Schuman, P., Boland, R.J., & Moore, J. (2001). Mortality, CD4 cell count decline, and depressive symptoms among HIV-seropositive women: longitudinal analysis from the HIV Epidemiology Research Study. *Journal of the American Medical Association,* 285(11), 1466-1474.

Ickovics, J.R., & Meade, C.S. (2002). Adherence to antiretroviral therapy among patients with HIV: a critical link between behavioral and biomedical sciences. *Journal of Acquired Immune Deficiency Syndrome*, 31 Suppl 3, S98-102.

Irwin, M., Gillin, J.C. (1987) Impaired natural killer cell activity among depressed patients. *Psychiatric Research,* 20:181-182.

Jackson, J.C., Cross, R.J., Walker, R.F., Markesbery, W.R., Brooks, W.H., & Roszman, T.L. (1985). Influence of serotonin on the immune response. *Immunology*, 54(3), 505-512.

Jones, D.J., Beach, S.R., & Forehand, R. (2001). Disease status in African American single mothers with HIV: the role of depressive symptoms. *Health Psychology*, 20(6), 417-423.

Kaaya, S.F., Smith-Fawzi, M.C., Mbwambo, J.K., Lee, B., Msamanga, G.I., Fawzi, W., (2002) The Kiswahili version of the Hopkins Symptom Checklist—25: Validity and calibration amongst HIV-positive antenatal clinic attendees in Dar es Salaam, Tanzania. *Acta Psychiatrica Scandinavica,* 106 (1):9-19

Kaharuza, F.M., Bunnell, R., Moss, S, Purcell, D.W., Bikaako-Kajura, W., Wamai, N., Downing, R., Solberg, P., Coutinho, A., Mermin, J., 2006. Depression and CD4 cell count amongst persons with HIV infection in Uganda. *AIDS and Behaviour*; 10(4 Suppl.): s105-s111.

Kelly, J.A., Murphy, D.A., Bahr, G.R., Kalichman, S.C., Morgan, M.G., Stevenson, L.Y., Koob, J.J., Brasfield, T.L., & Bernstein, B.M. (1993). Outcome of cognitive-behavioral and support group brief therapies for depressed, HIV-infected persons. *American Journal of Psychiatry*, 150(11), 1679-1686.

Keogh, P., Allen, S., Almedal, C., & Temahagili, B. (1994). The social impact of HIV infection on women in Kigali, Rwanda: a prospective study. *Social Science and Medicine*, 38(8), 1047-1053.

Kopnisky, K.L., Stoff, D.M., & Rausch, D.M. (2004). Workshop report: The effects of psychological variables on the progression of HIV-1 disease. *Brain, Behavior and Immunity*, 18(3), 246-261.

Leserman, J. (2003). HIV disease progression: depression, stress, and possible mechanisms. *Biological Psychiatry*, 54(3), 295-306.

Lyketsos, C.G., Hoover, D.R., Guccione, M., Senterfitt, W., Dew, M.A., Wesch, J., VanRaden, M.J., Treisman, G.J., & Morgenstern, H. (1993). Depressive symptoms as predictors of medical outcomes in HIV infection. Multicenter AIDS Cohort Study. *Journal of the American Medical Association*, 270(21), 2563-2567.

Murphy, D., Gardner, R., Greden, J.F., & Carroll, B.J. (1987). Lymphocyte numbers in endogenous depression. *Psychological Medicine*, 17(2), 381-385..

Perry, S., Fishman, B., Jacobsberg, L., & Frances, A. (1992). Relationships over 1 year between lymphocyte subsets and psychosocial variables among adults with infection by human immunodeficiency virus. *Archives of General Psychiatry*, 49(5), 396-401.

Rabkin, J.G., Williams, J.B., Remien, R.H., Goetz, R., Kertzner, R., & Gorman, J.M. (1991). Depression, distress, lymphocyte subsets, and human immunodeficiency virus symptoms on two occasions in HIV-positive homosexual men. *Archives of General Psychiatry*, 48(2), 111-119.

UNAIDS, 2006. 2006 Report on the Global AIDS Epidemic. Accessed at http://www.UNAIDS.org

Weisse, C.S. (1992). Depression and immunocompetence: a review of the literature. *Psychological Bulletin*, 111(3), 475-489.

(1993). Proposed 'World Health Organization staging system for HIV infection and disease': preliminary testing by an international collaborative cross-sectional study. The WHO International Collaborating Group for the Study of the WHO Staging System. *AIDS*, 7(5), 711-718.

Zorrilla, E.P., McKay, J.R., Luborsky, L., & Schmidt, K. (1996). Relation of stressors and depressive symptoms to clinical progression of viral illness. *American Journal of Psychiatry*, 153(5), 626-635.

APPENDIX:
DEPRESSION AND SOCIAL SUPPORT SUBSCALES

DEPRESSION SCALE: HSCL-REVISED

The HSCL-revised is composed of 8 items total, two from the 10-item anxiety subscale, and 6 from the 15-item depression subscale. The items are:

Feeling blue	Heart pounding or racing
Feeling trapped or caught	Crying easily
Difficulty falling or staying asleep	Feeling hopeless about the future
Worrying too much about things	Faintness, dizziness or weakness

Each item is scored on a 4-point scale (1='not at all'; 2='a little'; 3='quite a bit'; 4='extremely'). The scores are summed and divided by the number of items to obtain an average score ranging from 1-4. Using a cut-off of scoring above 1.06, these eight items together had 88% sensitivity and 89% specificity compared to a DSM-IV based diagnosis of clinical depression (Structured Clinical Interview for the DSM-IV). The HSCL-revised items had higher sensitivity and specificity in the validation study when compared with the HSCL-15 with a revised cut-off of 1.03, and the HSCL-25 with a revised cut-off 1.06. The standard cut-off of 1.75 for the HSCL-25 was found to be inappropriate for this study population; it resulted in very low sensitivity (35).

SOCIAL SUPPORT SCALE

Emotional (affective) support items included: (1) I get visits from friends and relatives; (2) I get useful advice about important things in my life; (3) I get chances to talk to someone about problems at work or with my housework; (4) I get chances to talk to someone I trust about my personal and family problems; (5) I have people who care what happens to me; and (6) I get love and affection. Material (instrumental) support items included: (7) I get help around the house; (8) I get help with money in an emergency; (9) I get help when I need transportation; and (10) I get help when I am sick. All items were scored on a 4-point scale (1='as much as I would like,' 2='less than I would like,' 3='much less than I would like,' 4='never'), summed, and divided by 10 for a mean score. For this analysis, the individual scale scores were reversed prior to calculating the mean score so high scores reflected better social support. Women were then classified as having low social support if their total score was less than the 10th percentile.

Chapter Seven

Discussion

Three main questions were posed by the study, the first having two sub questions: (1) What idioms of distress are emphasized in recollections of women with prior experience of depressed mood (for at least two weeks) during pregnancy? (1.a) Do derived expressions of distress have similarities to a depressive syndrome? (1.b) Is the 25 item Hopkins Symptom Checklist (HSCL-25) a valid depression screening tool for use in pregnant women in Dar es Salaam? (2) What socio-demographic factors are associated with symptoms equivalent to antenatal depressive disorder in HIV status naive women accessing antenatal clinics at government primary health care facilities in Dar es Salaam? (3) What effect does the occurrence of significant depressive symptoms, assessed during the prenatal period and a year post delivery, have on clinical indicators of progression of HIV disease and all cause mortality in women living with HIV and AIDS recruited from antenatal clinics in Dar es Salaam?

MAIN FINDINGS

For the first and related sub question (What idioms of distress are emphasized in recollections of women with prior experience of depressed mood (for at least two weeks) during pregnancy? and Do derived expressions of distress have similarities to a depressive syndrome?) narrative data from 23 unstructured interviews with three types of informants (traditional healers, midwives and women who had previously experienced prolonged sadness during pregnancy) aimed to describe recollected experiences and expressions of distress during pregnancy. A subsequent survey determined presence and severity of derived local distress idioms and 'standardized' symptoms of depression using the Hopkins Symptom Checklist (HSCL-25) and addressed relevance of local idioms for diagnosis of depressive syndromes through determining emergent constructs from pooled local and 'standardized' distress idioms. A two staged survey validated the use of the HSCL-25 as a depression screening tool amongst pregnant women with HIV infection accessing primary health care settings in Dar es Salaam.

Narrative analyses summarized in Chapter 2, showed women expressed and qualified recollected experiences of distress during pregnancy and acknowledged prolonged sadness was a pregnancy related concern. However, informant's attributed such sadness to physical health problems, socio-economic difficulties and/or effects of supernatural agents or phenomenon rather than mental illness (Chapter 2). When analyses focused on accounts of prolonged sadness during pregnancy, this idiom clustered with other distress idioms in patterns similar to a biomedical mixed depression and anxiety syndrome. Prolonged sadness, though not in itself considered to be illness, was expressed most frequently as *"Kusononeka"* an idiom that was characterized as sadness beyond the norm, with slowed down activities, and that was always reported with some impaired social functioning. Sadness of this

intensity was sometimes reported with behavioural and other emotional (irritability, anxiety, tension, and panic expressed as wanting to scream or screaming without apparent cause) and distress related somato-physiological changes (pain, palpitations, and shortness of breath).

Illness behaviors are influenced by causal explanatory models of illness that refer to the patient's and family's conceptions of the nature of a particular illness, its causes and effects, expected and/or desired treatment, and apprehensions about the outcome (Ware *et al*. 1992). Findings showed that cultural norms transmitted and maintained by traditional socialization and healing institutions shaped women's explanatory models for experienced ill health during pregnancy, by defining or making known, through protective and therapeutic rituals, likely causes of what were termed 'problematic pregnancies'. Perceived causal models also shaped how distress was expressed; feeling alone or abandoned predominated when absence of social supports were perceived to cause illness and fear and panic when biomedical or supernatural causes of ill health were perceived. Findings summarized in Chapter 2 showed that overall, attribution of supernatural causes predominated in women's accounts of problematic pregnancies with pregnancy defined as a time of increased vulnerability to such influences on health. However, both allopathic and traditional healthcare systems were important in women's sources of recourse when problematic pregnancies occurred. The potential for local illness explanatory models to shape the social significance of experiences during pregnancy is reported in a study that aimed to understand complementary use of antenatal clinic services and traditional medicine in South Africa (van der Kooi *et al*. 2006). This study showed that informants (pregnant and new South African mothers) used allopathic antenatal services for the monitoring of pregnancies, while traditional medicine provided protection from most physical problems caused by supernatural agents as a result of social problems such as interpersonal conflicts with a mother-in-law or with ancestors. Studies in both sub-Saharan African populations (van der Kooi, 2006; Abrahams *et al*., 2002) and other non-Western populations such as in Malaysia (Grace *et al*, 2001) also showed a perceived higher vulnerability of pregnant women to supernatural influences on health. As summarized in Chapter 2, similar protective practices and taboos during pregnancy are reported such as the use of amulets during pregnancy to protect against sorcery (Abrahams *et al*, 2002); and avoiding sitting in doorways to prevent obstructed labour (Grace *et al*, 2001). A high value placed on uncertainty avoidance (perceptions of being threatened by uncertain or unknown situations) in a cultural group, has been hypothesized to result in greater emphasis placed on social rules and obligations, with tendencies to sanction higher levels of anxiety, through conceiving actions as norms transgressions (Hofstede, 2001). While the relevance of this hypothesis to the settings addressed in this thesis is beyond the scope of the reported studies, it is worthy to note that Grace *et al*. (2001) showed higher distress scores in Malaysian post-natal women adhering to protective

practices during pregnancy, than not; such associations being significant for adherence to protective practices during the early postnatal period. Lutz (1985) emphasized that recognition of emotional disturbance should always be considered as relative to culturally defined desirable levels of emotional expression rather than as an absolute concept. The challenges for measurement of clinically significant emotional disturbances are in disentangling desirable from excessive levels of emotional expression.

To explore the relevance of identified local expressions of distress to measurement of clinical significant depressive morbidity, responses to both local idioms (30 items) and conceptually different HSCL-25 items (17 items) were analysed from 787 consecutively recruited pregnant women booking for antenatal care at primary care clinics not providing screening services for HIV infection (See Chapter 3). Findings showed endorsement by 5% or more of seven local idioms of distress commonly expressed across more than one perceived cause of pregnancy related problems derived from the formative study findings. While feeling sad was endorsed by only 10% of women, the three most frequently endorsed local distress idioms were somatic and behavioural concerns including headache (28% endorsed), feeling tired or fatigued (22% endorsed), and forcing one's self to do normal chores (12% endorsed), while the least frequently endorsed was difficulty in being with or mixing with others (5% endorsed). Logistic regression analysis reduced 47 pooled local idioms and HSCL-25 items, to 19 items discriminating more from less distressed women. Three of the 19 items were common to more than one perceived cause of problematic pregnancies (See Chapter 2); two being somatic concerns (headache and feeling tired) and one was behavioural (difficulty in being with or mixing with others). The 19-item symptom checklist named the Dar es Salaam Symptom Questionnaire (DSQ) (see Chapter 3), showed relative independence of items with adequate internal consistency, stability of responses over time and inter-rater reliability. Item severity scores ranged from 1 to 3 on a 1-4 severity scale with higher scores indicating greater distress. The DSQ showed adequate discriminate and criterion validity; supporting a priori assumptions that higher scores would correlate negatively with lower perceived health related quality of life measures and showing significant associations between high DSQ scores and factors known to be associated with depression (lower economic status, single marital status and less involvement in decision making in the home). Prolonged sadness, one of two unique features required for diagnosis of depressive disorder according to the Diagnostic and Statistical Manual of Mental Disorders IV (DSM IV) (American Psychiatric Association, 2000) and the International Classification of Diseases version 10 (ICD 10) (World Health Organization, 1992) criterions, did not emerge as a discriminating symptom in the DSQ. However, eight of the most frequently endorsed DSQ items; headache, feeling tired, loss of sexual interest or pleasure, sleep disturbances (excessive or broken by dreams), inability to mix and talk with people, crying easily,

thoughts of ending one's life and feelings of worthlessness were similar if clustered to a biomedical somatic depression-like syndrome. Factor analyses determined five components of DSQ items that would be least correlated and made a maximum contribution to the sum of variance of DSQ scores. Assessment of distress idioms within the extracted components showed that when requested to endorse recent emotional experiences using structured face-to-face interviews, pregnant participants emphasized somatic concerns, fear/anxiety and behavioural features of distress, further supporting formative study findings (Chapter 2). The first two extracted components that together explained 24.5% of variance in DSQ items scores for example, represented constructs of social withdrawal and confusion/panic explaining almost equal variances in DSQ scores (12.6% and 11.9% of the variance respectively). The remaining components represented somatic depression (10.8% of variance), physiological anxiety (10.3% of variance) and fatigue (9.4% of variance) constructs.

Though the design of the local idioms survey did not allow for conclusive determination of whether items representing the social withdrawal construct were part of, cause or effects of distress, their salience for the women surveyed can be partly explained by the predominantly multifocal family structures in the study area (see Chapter 2). Within such family structures, the ability to maintain harmonious relationships with a wide range of family members would be a required attribute. In the Chinese culture where multifocal family structures are also common, women are expected both to adjustment to a 'new' family after marriage and be obedient and respectful to the older generation (Young, 1995). Kazi *et al*. (2006) in Pakistan reported findings from indepth interviews with pregnant women that showed conflicts in relationships with extended family members (in-laws) was an important source of stress. Poor relationships with in-laws have been associated with increased depressive scores in pregnant women, almost as much as poor relationships with a partner (Lau *et al*., 2007; Kazi *et al*., 2006). Though the cross-sectional nature of studies precluded confirming causal relationships, it can be argued that despite a potential for greater social support afforded by multifocal family structures, the challenges faced to maintain harmony may be a high emotional price to pay, particularly when pregnancy occurs in young person's and soon after marriage. The ICD-10 (World Health Organization, 1992) recognizes functional impairments as a result of depression as a useful guideline for assessment of severity. However, cultural influences that may result in variations in social definitions of desirable gender roles across groups may disrupt the smooth relationship between severity of depressive symptoms and social performance of defined roles, hence precluding use of specific functional impairments as core diagnostic criteria. Bolton *et al*. (2002) showed that addition of culture sensitive features of functional impairment improved the ability of the HSCL-25 to detect depressive morbidity in an African community-based setting. The absence of a 'gold standard' for depressive disorder in

these analyses prevents conclusively showing that idioms representing a social withdrawal construct should be considered as core in assessments of depressive morbidity in the study population. However, unique distress idioms representing the social withdrawal construct may be useful indicators of poor social functioning to guide assessments of illness severity.

The confusion/panic and somatic constructs of the DSQ support the formative study findings of prolonged sadness clustering with anxiety, panic and somatic concerns (Chapter 2). Low awareness of depression as an illness in both pregnant women and health care providers as shown from formative findings and other SSA studies (Gureje *et al*., 1997; Whyte *et al*., 2001) may reinforce women's minimization of experiences of sadness. Several studies have similarly shown unique expressions of depression among perinatal and non perinatal women in non-Western contexts. In a community-based study of depression in Zimbabwean women of child bearing age, Patel *et al*. (2001) showed the term depression was used to denote an illness rarely presenting with emotional symptoms, rather women reported multiple somatic complaints such as headache and fatigue. Jinadu and Daramola (1990) showed that nausea, vomiting or feeling "hot in-the-head", may be symptoms of depression in Nigerian peri-natal women. Furthermore, studies show Japanese women tend to express emotional complaints by referring to physical problems or worries about child care rather than by expressing depressed feelings (Yoshida *et al*., 1997), and that Chinese women may speak of head numbness or wind in the head, rather than sadness (Lee *et al*., 2001a). Such somatic presentations of depression have, however, also been reported in low-income pregnant women accessing primary health care settings in Western contexts (Kelly *et al*, 2001; Josefsson *et al*, 2001). Kelly *et al*. (2001) showed, after adjusting for socio-demographic and maternal medical risk measures, associations between depression and/or anxiety and somatic symptoms in second trimester low income pregnant women in the United States. Such unique expressions of depression are important to understand as particularly somatic presentations in primary care settings have been associated with missed depression diagnoses (Manchetti *et al*., 2009; Escobar *et al*, 2006).

The lack of depression as a defining symptom in the DSQ may not necessarily preclude its utility as a depression screening tool amongst pregnant women in the study area. It is likely that depressive morbidity covers a wider range of expressions than those represented in standardized screening tools. The importance of alternative features of depression in assessments of perinatal depression is reinforced by evidence that a widely accepted perinatal depression screening scale, the Edinburgh Postnatal Depression Scale (EPDS) (Cox *et al*. 1987), may not be accurate in its underlying assumptions of the universality of psychological expressions of depressed mood. A recent review of EPDS validation studies, showed high between study variations in sensitivity (range 65% to 100%) and specificity (range 49% to 100%) for detecting depression with wide confidence intervals around these estimates in most

of the reviewed studies (Eberhard-Gran, 2001). The utility of a specific screening tool for perinatal depression is also challenged by evidence of equally satisfactory sensitivity and specificity estimators with depression screening tools not specifically developed for perinatal populations, as summarized in Chapter 4 and other perinatal depression studies (Lee *et al*., 2001b; Beck & Gable, 2001).

In conclusion, understanding local distress idioms has the potential to add value to development and adaptation of depression screening tools at both local and global levels through research elucidating more comprehensively what is core in depression expression cross culturally. Expressed sadness as a universally essential feature of a depressive episode may be challenged by evidence shown in Chapter 3 that though experienced; its endorsement was not a discriminator of high distress scores. On direct inquiry about mood states, distressed women in the study context placed less emphasis on experienced sadness and more on behavioural, panic/confusion, somatic concern and fatigue constructs of emotional distress. Socio-economic and environmental factors subject to culture-specific standards and may influence reporting styles for depressive morbidity across perinatal groups of women. Some of these factors include; pre and postnatal access to healthcare, quality of care available, procedural differences, religious customs, nutrition, actual and perceived levels of social support, poverty or its perception, stress, attitudes regarding pregnancy and motherhood as well as attitudes regarding mental disease and biological vulnerability (Dankner *et al*., 2000). Socio-economic status, low access to quality antenatal care services, group rather than individual oriented cultural models and associated culture based attitudes and values related to safety during pregnancy are some of the factors identified in the formative phase of the study that may have shaped the unique ways in which experiences with prolonged sadness are expressed.

To determine if the 25 item Hopkins Symptom Checklist was a valid depression screening tool for use in pregnant women in Dar es Salaam, DSM-IV depression criteria was used as a gold standard. The HSCL-25 was selected because both depressive and anxiety symptoms shown to co-occur in women's narratives (Chapter 2) are measured. Evidence of the cross-cultural utility of the HSCL-25 (Mollica *et al*, 1987; Hinton *et al*, 1994; McKelvey & Webb, 1997), its simplicity and hence potential for use by nurse midwives with limited training in mental health, also guided its selection. The high prevalence of HIV and AIDS in Dar es Salaam, and anticipation of greater future need to assess for depression during pregnancy guided the decision to validate the HSCL-25 in pregnant HIV positive women. A two phased designed survey collected data from 1,078 HIV-positive second trimester pregnant women. In the first phase a stratified random sampling approach selected from 903 participants with completed pre-delivery psychosocial information, 50 each with HSCL-25 scores above and below a cut-off of 1.75 for "caseness" on the depression subscale. Within two weeks of HSCL-25 assessments, diagnostic interviews using the

depressive disorder, mixed anxiety and depression, somatisation and pain disorder modules of the Structured Clinical Interview for DSM-IV diagnosis (SCID) (First *et al*., 1995) were administered by psychiatrists blind to participants HSCL-25 scores.

The HSCL-25 showed good statistical reliability of the total scale and its anxiety and depression subscales (alpha estimates of 0.93, 0.90 and 0.85 respectively), and adequate discriminant validity. Most of the variance in the HSCL-25 scores was explained by the mixed depression/anxiety construct (39%). The remaining three components derived from principal components analyses, were anxiety-panic, psycho-physiological and physiological constructs. This analysis did not clearly demonstrate separate psychological Vs somatic or depressive Vs anxiety constructs of distress and supported formative study findings of unique tendencies to express significant emotional distress in somatic terms with an anxiety overlay. Criterion validity of the HSCL-25 determined using DSM IV depressive disorder criteria as a "gold standard", showed that in ROC analyses eight HSCL-25 items, two anxiety and six depressive symptoms, had an area under the curve (AUC) equal to or greater than 0.6. ROC analyses weighted to account for the different sampling fractions during validation (cluster sample of 100 participants), showed mean (sensitivity and specificity) optimal cut-off points for detecting major depression of 1.06 (89%, 80%) with the HSCL-25, 1.03 (89%, 79%) for the HSCL-15 and 1.06 (89%, 85%) for the HSCL-revised (new 8 item scale the KHSCL). Evidence for adequate criterion validity of the KHSCL was reinforced by demonstrated similar results when the 1.06 and higher 1.75 cut-off score were used to assess effects of depression on progression of HIV disease in pregnant women, an analysis that is summarized in chapter 6 of this thesis (see Chapter 6). This finding suggested the low cut-off score sufficiently discriminated depressive morbidity despite identified instrumental challenges in depressive symptoms assessments as outlined below.

The findings showed a tendency towards reporting lower symptom severity when standardized depressive symptoms were used in structured interviews. It is possible that a large proportion of pregnant women with depressive symptomatology may have milder depressive disorder (Wissart *et al*. 2005). However, low severity scores may also be a result of difficulties in self-evaluations of symptom severity when participants were presented with less culturally sensitive or resonant ways of expressing depression. Furthermore with reference to emotions in the cultural context it may also be possible that there is a cultural tendency to avoid extreme scores on a response scale; an important source of method bias when using scaled measurements (Poortinga & Foden, 1975; Hui & Triandis, 1989). For example, responses to the more culturally sensitive and less emotive DSQ items suggested relatively higher severity ratings with mean scores greater than 1.1 shown for 63% of the local distress idiom items compared to only 47% of the 17 HCSL items in the pooled expressions of distress described in Chapter 3 (see Table 2). Secondly, formative study findings showed that informants used a variety of different idioms to qualify the

intensity of experienced sadness, rather than reporting sadness experiences as less or more. The requirement to verbally describe severity of sadness, using the same distress idiom may pose significant challenges to study participants. Such variations do not only show what but also how and when idioms of distress are emphasized and poses important methodological challenges when universality in illness expressions is assumed (Patel, 2006). Similar mean scores, for example on the sadness item within study participants may not have the same meaning, as how distress was expressed varied by perceived attribution of causes for distress. In a review of potential biases that can arise during cross-cultural translation of psychological screening tools, Van de Vijver & Poortinga (1997) list construct bias as one of the major instrumentation biases arising out of an assumption that psychological constructs conceptualized in a particular theory or tradition are universal. Finally, the HSCL-25 may not have provided sufficient scope to accommodate somatised expressions of depression. The six most frequently endorsed symptoms on the DSQ (about a third of all symptoms) endorsed by 18% or more of the women at mean scores of between 1.24 to 1.37 were somatic symptoms reflective of the more somatised expressions of depression common to the cultural context of study participants. In contrast the HSCL fewer 'standardized' somatic items, hence only two (12%) of 17 pooled HSCL-25 items (Chapter 3) and four (16%) of all HSCL-25 items (Chapter 4) with more than 10% endorsement frequencies, reflected somatised expressions of distress.

To respond to the second research question ("What socio-demographic factors are associated with symptoms equivalent to depressive disorder during pregnancy in HIV status naive women accessing antenatal clinics at government primary health care facilities in Dar es Salaam?"), a prospective survey recruited 787 consecutive second and third trimester pregnant women booking for antenatal care at two peri-urban clinics and measured depressive symptoms using the adapted eight-item version of the HSCL(KHSCL). Socio demographic, objective and subjective wealth status measures, proxy measures of the value partner's placed on participant's opinions as well as selected physical health measures were collected at study enrolment. Perceived quality of relations with the current partner was assessed at 36 weeks gestation. Results summarized in Chapter 5, showed a high prevalence (39.5%) of depressive symptoms comparable to major depression. The prevalence of significant depressive symptomatology was consistent with findings from other studies in low-income populations of pregnant women (Kazi *et al*., 2006; Holzman *et al*., 2005). After adjusting for age, parity and number of children in the home, significant depressive morbidity was independently and positively associated with previous depressive episodes, low and moderate satisfaction with ability to access basic needs, frequent verbal or physical confrontations with partners in the year prior to assessment and booking earlier for antenatal care. A common concern that symptoms of depression during pregnancy may overlap with those of common

pregnancy related physical illness was not supported as depressive morbidity was not influenced by presence of malarial parasites or anaemia at the time of assessment.

Other studies have also shown previous episodes of depression to be a risk factor for depression during pregnancy (Ross *et al*., 2004; Marcus *et al*., 2003). Experiences of previous episodes of depression may be a clinical marker for underlying biological vulnerability that if assessed routinely can raise health care provider's index of suspicion for recognition of depression during pregnancy. The dose related association between depression and level of satisfaction with ability to meet basic needs with depression adds credence to associations between depression and relative poverty and supports findings of studies conducted elsewhere (Rochat *et al*., 2006; Holzman *et al*., 2005; Haas *et al*., 2004; Pajulo *et al*., 2001). The lack of associations between depression and objective measures of wealth status was contrary to findings of other studies in pregnant women (Faisal-Cury *et al*., 2007; Baker *et al*., 1997). However, this contrary finding may be explained by the minimal wealth differentials in the sample as the mean score on the ten item household wealth status index was 4.7 with a rather limited standard deviation of 1.49. This was also supported by anecdotal observations of greater utilization of public and free antenatal services by women of lower socio-economic status. The associations found between depression and conflicts with partners, has also been consistently shown in studies across different socio-cultural contexts (Fisher *et al*, 2007; Feri *et al*., 2007; Flyn *et al*., 2007; Adewuya *et al*., 2007; Lovisi *et al*., 2005; Fatoye *et al*., 2004). However, lack of information on the onset of endorsed depressive symptoms relative to partner conflicts makes it difficult to conclusively establish whether reported conflicts reflected cause or effects of depression. It was of interest that women with depressive morbidity during pregnancy were significantly more likely to book for antenatal care at an earlier gestational age than there non-depressed counterparts. This finding suggests that somatised presentations of depression shown by the findings of the formative and methodological studies summarized in Chapters 2-4 may have resulted in presentation of physical complaints at a relatively early gestational age at primary care facilities, providing potential opportunities for early recognition and management of significant depressive morbidity in antenatal settings. While the studies did not address recognition of depression by health care providers, there is evidence that primary care staff can be trained to help patients presenting with somatised presentations of emotional distress to reattribute symptoms to psychological causes (Kaaya *et al*, 1992).

In conclusion, depressive morbidity during pregnancy was high in an antenatal population sample in Dar es Salaam. In primary care antenatal clinics, high index of suspicion of depressive disorders should occur when pregnant women report: previous episodes of depression, or conflicts with partners, or lower socio-economic status, or who book at an earlier gestational age than usual for care. Responses such

as screening for depression by nurse-midwives and referring high scoring women to attending clinicians (clinical officers and assistant medical officers) for diagnostic assessments and management are recommended.

To answer the third research question (What effects does depression, have on clinical indicators of progression of HIV disease and all cause mortality in women living with HIV and AIDS recruited from antenatal clinics in Dar es Salaam?), the effect of depression on HIV disease progression assessed with the KHSCL, was examined among 996 HIV-positive pregnant Tanzanian women of mean age 25 years and gestational age 18 weeks participating in a trial on micronutrients and pregnancy outcomes, vertical transmission, and disease progression. Depressive symptoms and social support were measured two months after HIV screening, and every six to 12 months thereafter (Chapter 6). Depression measures from pregnancy and more than 12 months postpartum were included in the analysis, in order to remove potential confounding effects of depression with onset in the first twelve months after delivery. Participants' clinical condition and access to supportive individual and/or group counselling was assessed throughout the six to eight years of follow-up. Cox proportional hazard models were used to estimate the effects of depression, access to counselling support, and baseline social support on progression to HIV stage III/IV (World Health Organization), and all-cause mortality. Results showed 43% of pregnant participants at initial assessment had symptoms comparable with depressive disorder, and over half (57%) of the study sample at least once had symptoms during the follow-up period. These prevalence estimates of depression among Tanzanian HIV infected women are remarkably similar to a U.S. cohort of HIV-infected women (Cook *et al*., 2004), and were consistent with a cross-sectional assessment of depression and HIV among men and women in Uganda (Kaharuza *et al*., 2006). After adjusting for clinical or immunological predictors and socio-demographic correlates of disease progression, depressive symptoms among HIV-infected women were associated with significantly increased risk of clinical disease progression to WHO stages III/IV. Depression was also predictive of over a two-fold increased risk of death. These findings support the hypothesis that depression was an independent predictor of HIV disease progression and mortality among HIV-infected women.

Perceived social support at baseline did not modify the effect of depression on disease progression and mortality. Counselling and/or support group attendance also was not associated with the outcomes of interest. However, the study was not designed to test the effects of a psychosocial intervention on disease progression. Though counselling interventions were open to all study participants, provider selection and self-selection determined access. Women who were either depressed, had low social support, and/or stressful life situations and were actively seeking or referred for counselling interventions were hence over-represented. Although this study did not identify positive effects of counselling on disease progression or mortality, concluding a lack of mitigating effects of counselling on HIV disease progres-

sion is not possible and there is need for additional systematic studies that are specifically designed to measure the effectiveness of different psychosocial interventions. Few studies have quantitatively examined psychosocial interventions for depression in developing countries (Kelly *et al*., 1993). An exception is a recent community-based study conducted in a high HIV sero-prevalence rural area in Uganda that reported very high rates of recovery among depressed individuals after participation in a 16-week group interpersonal therapy program (Bolton *et al*., 2003). A more recent randomized facility-based trial in Tanzania compared the effectiveness of weekly closed group supportive counselling sessions for a period of six weeks to individual supportive counselling sessions on demand (standard care) for reducing depressive symptoms in HIV positive pregnant women. Pre-intervention depression scores were not significantly different in the two arms and at post intervention 68.6% of 331 recruited pregnant women took up assigned counselling or standard of care interventions. Amongst 189 HIV positive pregnant women with completed measures, a significantly lower proportion in the intervention (60%; n=97) compared to standard care arm (73%; n=91) had symptoms comparable to depression at post-intervention assessment (Blander *et al*, [under review]). However, this study also showed challenges related to both interventions uptake and retention in HIV positive pregnant women; completed measures at post intervention being available for only 83.3% of those that consented to participate and accessed the interventions.

In conclusion, depressive morbidity is higher in HIV positive pregnant women than in their HIV status naive counterparts; such depression increased significantly both the risk of HIV clinical disease progression to WHO stages III/IV and mortality. While there is need for additional studies to understanding the mechanisms underlying associations between depressive morbidity and HIV disease progression, the findings support recommendations for developing effective, acceptable and sustainable interventions for the recognition and management of depressive disorders in perinatal populations in Southern Africa where the burden of HIV and AIDS is high.

METHODOLOGICAL CONSIDERATIONS

Issues related to study measures and design: In analyses aimed at responding to the first study question of describing local idioms of distress and determining their relevance in measurement of depressive symptoms, depth of understandings and interpretation of findings from studies was enriched by the combination of qualitative and quantitative methodologies. Qualitative methodologies were particularly suited to understanding distress during pregnancy in a natural setting, giving due emphasis to the experiences and views of all study participants. The approach allowed for

understanding of what informants actually meant when they described their experiences and behaviours. They are however, limitations in generalizing the findings of idioms of distress emergent from narrative accounts summarized in Chapter 2. Informants were from a single locality representing at most three to four of the 125 cultural linguistic groups in Tanzania. It can, however, be argued that the Bantu are the largest ethnic group in the country, with similarities in customs across linguistic sub-groups. Common use of Kiswahili throughout Tanzania may also facilitate diffusion of cultural structuring of pregnancy experiences and related meanings and expressions of distress. The five year recall timeframe required of previously affected women (PAW) informants was a second limitation, though it was anticipated that experiences of distress would be significant enough to be recalled, the potential for recall bias was high. The process of selection of PAW informants most able to provide the required information and triangulation by comparing and contrasting accounts from different types of informants may, however, have increased the validity of study findings.

A second limitation related to potential biases in determining and measuring a culturally sensitive concept of depressive morbidity as summarized in chapters 3 and 4. First the potential for method biases in measurement of depression was a challenge that was perhaps difficult to adequately address in the studies. Both studies recruited semi-rural or urban women, with limited levels of education and generally low socio-economic status that were reticent in expressing distress in psychological terms. Bias arising from social desirable responding is a risk that has been noted in studies that recruit participants from low socio-economic status backgrounds (Welte & Russel, 1993). The potential for construct bias has been noted in the results section. The methodological challenges of developing screening tools that include local nuances in expressions of sadness may be difficult to address. For example within the same population group sadness can be expressed as either *kusononeka* or the less frequently used term *uchungu rohoni/moyoni,* implying perhaps qualitative differences in experiences of sadness. Respondents may have varied in the extent to which these terms qualified as being “extremely” sad, risking biases at a conceptual level. Furthermore, method bias could occur when respondents are required to use unfamiliar verbal analogue scales to determine intensity of an emotional experience, in a manner that was unfamiliar, such a varying severities of feeling sad.

Thirdly, the scope of the studies reported in Chapters 3 and 4 limited the undertaking of developing a Dar es Salaam Symptom Questionnaire (DSQ). While deemed appropriate as a starting point, there are major limitations to the use of an antenatal population for guiding general studies, as noted elsewhere (Lee *et al*, 2008). Furthermore, the use of logistic regression, in the absence of a gold standard in determining criterion validity of the DSQ did not allow for a receiver operating characteristic analysis. However, this was intentional, with plans to apply the knowledge

gained from this internal analysis to diagnostic interviews of the general population, which will yield a comparison of DSQ results with clinical judgment. The issue thus points to the general difficulties of establishing a valid psychiatric instrument. Psychiatry brings with it a culture, institutional epistemologies, and attitudes toward illness and suffering. While openness to local explanatory models and expressions is intended to counteract some of these effects, that the very lens through which we make our observations is heavily affected by biomedical training is unavoidable. These issues inevitably applied to analyses presented in Chapters 2-4 of this thesis, which intend to be not an endpoint but a beginning, from which gradual improvement in understanding of psychopathology through examination from different angles can occur.

The study design for the findings reported in Chapter 5 had a major strength in the use of socio-economic measures derived from formative inquiry. The study design, however, was limited by generally late booking for antenatal care and women were hence assessed in the late and not earlier trimesters of pregnancy when rates of depressive morbidity may be lower (Brooks *et al*., 2009). Furthermore, duration since onset of depressive symptoms was not measured, making it difficult to determine if the observed psychosocial risk factors are a result of selective emphasis of negative aspects of experiences due to depression or if they preceded mood changes. Finally assessment of depressive morbidity relied on a symptom-screening instrument. While a locally adapted and validated tool to screen for depression in pregnancy can serve as a proxy measure of depressive disorder, prudence in interpreting the rates is advised as symptom screening tools overestimate depression rates (Bennet *et al*. 2004). These limitations, though important, do not detract from the ability of study findings to adequately address the study objectives, which was to identify risk factors that could alert health care providers in primary care antenatal clinic settings and prompt further diagnostic investigations for early diagnosis and management.

In the study summarised in Chapter 6, that aimed to determine the effects of perinatal depression on clinical progression of HIV and AIDS and mortality, was achieved by pragmatically including a psychosocial component to a double blind randomized controlled trial designed to assess the effects of multivitamin supplementation on pregnancy outcomes and progression of HIV disease. While the study design allowed for an assessment of effects of depression assessed during pregnancy on HIV disease progression, random assignment to psychosocial interventions (group and individual supportive counselling) was not achieved due to both resource limitations and ethical implications for the larger study. Participants receiving psychosocial interventions were likely to have been provider or self-referred women that actively sought to improve their psychosocial status, either due to high depressive symptomatology, reported low social support, and/or stressful life situations. This lack of random assignment to interventions limited the ability to system-

atically determine any buffering effects of the psychosocial intervention on the relationships between depression and HV disease progression. It was hence not possible to conclusively determine mitigating roles of psychosocial interventions as, while the services were open to all study participants, research staff also selectively referred women identified to be at high psychosocial risk to the services.

Missing data and measures: In analyses summarized in Chapter 5 missing measures were reported. In the determination of risk factors associated with depression during pregnancy (Chapter 5), all 787 consecutive antenatal clinic attendees that consented to participate in the study provided measures at recruitment. However, missing measures occurred for data collected at a 36 weeks gestation visit resulting in only 600 (76.2%) participants with completed antenatal assessments. Just over a quarter of all missing measures (n=187) were contributed by participants discharged from follow-up (n=52, 27.8%) as per protocol due to foetal loss/stillbirth (n=43) or death of the participant and/or the infant (n=9). However, for the remaining 135 participants, the missed second study visit was due to a residence change (65.2%) and reasons for missing the study visit were not available for the remaining 34.8%. Available resources limited tracing of participants with missed visits to one home visit, using detailed map cues provided by participants at recruitment. Failure to return to the study clinic in a specified period following such a home-visit was defined as lost to follow-up. The relatively cheaper accommodation costs in the peri-urban localities of the Temeke Municipality of the Dar es Salaam region, attracts rural to urban migrants. However, once new immigrants begin to earn incomes, they can afford to live in localities closer to the city centre and this may explain the observed attrition due to changes in residential addresses. For study participants with no reasons available for a missed scheduled study clinic visit, map-cues provided by participants had insufficient detail to allow locating residences. Improved documentation of map cues decreased the problem of incomplete map cues to a certain extent. These included use of names by which a woman was known in her neighbourhood rather than her given name and use of bus stops as identifiers for residences where street names were absent. Of 33 women included in the analysis that had missed a visit and were tracked and located, as per protocol, forms were filled in the home. However, because the clinical visit was missed, blood samples could not be collected and this explains the 5.5% missing haemoglobin and malaria parasite measures. Despite these missing responses, the study findings may not have been greatly compromised. Analysis of socio-demographic measures (age, education level, marital status, employment in the year prior to assessment) of participants included in the analysis and those excluded showed insignificant variations.

For the study reported in Chapter 6, that aimed to determine the effects of perinatal depression on clinical progression of HIV and AIDS and mortality, an inclusion criteria for the psychosocial component was enrolment to the parent study

that was a double blind randomized controlled trial designed to assess the effects of multivitamin supplementation on pregnancy outcomes and progression of HIV disease. Women that were HIV positive but did not enrol to the parent study were similar to those that did in age, education and marital status; however, they were significantly less likely to be solely housewives and more likely to be self employed in business or petty trade activities. Analyses were focused on participants that had completed prenatal psychosocial measures that were missing for only 82 (7.6%) participants; indicating a very good study accrual rate. However, in order to remove the potentially confounding effects of postnatal depression on progression of HIV disease only 652 (65.5%) of the 996 women followed up for a mean of 61-months (range 2-98 months) with at least one depression measure 12 months post delivery to the end of their follow-up were included in the analyses. Missing values for the outcomes of interest were minimal with 2% of those with prenatal social support scores having missing values and 5.5% missing baseline CD4 count values.

PRACTICE IMPLICATIONS

The findings from the formative phase provided important guidance, specific for the context in Dar es Salaam for both clinical assessments of depressive morbidity in perinatal women and for future adaptations of depression symptom screening tools. Firstly the findings suggest windows of opportunity for assessment and recognition of depression in perinatal women. Women that are or have experienced depressive morbidity are willing and able to describe their experiences. While depressed mood in itself is not perceived to be an illness, other features of depression such as loss of energy, fatigue, and having many thoughts are perceived as such. Clustering of such, with symptoms of pain and particularly with social dysfunction in intrapersonal interactions are features that should alert health care workers in primary care settings.

Furthermore, pregnant women with previous depressive episodes, or reporting relative poverty or conflicts with their partners or that book early for antenatal care, should also raise provider's index of suspicion of possible depressive disorder. The implications of these findings in antenatal care services in low income settings characterized by poor infrastructure including space limitations to afford necessary privacy for discussion of psychosocial issues and human resource constraints, suggest need for further health services studies. These include exploration of provider's willingness to extend services in antenatal care beyond a restricted focus on physical health, and appropriate modalities that will allow for focus on more wider psychosocial issues in pregnant women's lives.

The need and benefits of broadening the scope of antenatal care settings is already recommended in guidelines for integration of mental health in primary health

care (MoH&SW, 2006). However, evidence of poorer health outcomes in women living with HIV that suffer from symptoms equivalent to a depressive episode when pregnant provides additional impetus to address perinatal depression. Increasingly PMTCT services in antenatal care, where women are often learning for the first time of their HIV sero-status as a result of provider initiated testing and counselling, are providing environments conducive for psychosocial interventions. In treatment services within Dar es Salaam for person's living with HIV and AIDS, while sero-prevalence in women is generally higher, this may explain the over-representation of women compared to men (2/3rds of all) enrolled to services. Public health interventions that identify and treat depression could slow progression to AIDS and may potentially lower the overall psychosocial burden and suffering caused by HIV. These findings also have implications for recent initiatives to provide broader access to antiretroviral (ARV) medications in resource-poor settings. Early recognition of women at risk and prevention of perinatal depression may have the potential to slow progression of HIV disease, and prolong relatively good quality of life with HIV and AIDS prior to the need to initiate ARV medications.

There are however significant challenges to PMTCT and other HIV care and support programs. How can such programs design, budget for and provide effective interventions to identify and manage depression within resource poor public health systems? In the study, summarized in chapter 6, although support group meetings were open to all study participants, fewer than 1 in 5 women attended and only 1 in 4 depressed women sought the services of individual counselling. Thus, despite the availability of such interventions, and the fact that high risk women were actively referred to them, levels of participation remained low. Barriers could simply be logistic, related to the timing of group and individual support sessions, quality and/or privacy of the counselling space, or transport costs. Nevertheless, concerns about confidentiality, fear of HIV serostatus disclosure, and stigmatization may also inhibit full participation in counselling or peer-supported psychosocial interventions among HIV-infected women.

AREAS FOR FUTURE RESEARCH

Preliminary analysis of the DSQ, suggests its potential as a tool for the assessment of significant distress in antenatal care settings in Dar es Salaam. Further research is, however, required firstly to calibrate DSQ scores against standard diagnostic criterion measures for depression in order to establish depression "caseness" cut-off thresholds. Furthermore, the summarized studies are restricted to perinatal populations, limiting availability of evidence for utility of the DSQ in other primary care populations.

Additional formative studies are required exploring expressions of distress in men and women in primary care settings, and comparing and contrasting findings to describe any additional local distress idioms that can be pooled with DSQ items for future validated studies and screening tool calibration, prior to its wider use beyond populations of pregnant women. Such inquiry in addition to determining core features of depressive morbidity in the Tanzanian context will add to a growing cross-cultural international literature on assessment and recognition of distress idioms that may constitute core features of expression of depression in patients accessing primary health care services.

Research to understand the mechanisms of the associations between HIV disease and depression in perinatal women is also required. Understanding the mechanisms of the association would provide useful information on what interventions can be developed that are feasible and sustainable given existing resources. Intervening to reduce or prevent depression in these population subgroups would be extremely important to increase uptake of self-management strategies including safe disclosure of HIV serostatus, access to care and treatment and adherence to medical and nutritional recommendations.

Intervention research using appropriately designed trials and targeting populations heavily burdened by HIV are urgently required for the development and testing of effective interventions for managing depressive symptoms. Barriers to participation in psychosocial support interventions and mechanisms also need to be further investigated and addressed through operational research and programmatic experiences.

REFERENCES

Abrahams, N., Jewkes, R., & Mvo, Z. (2002). Indigenous healing practices and self-medication amongst pregnant women in Cape Town, South Africa. *African Journal of Reproductive Health*, 6(2), 79-86.

Adewuya, A.O., Ola, B.A., Aloba, O.O., Dada, A.O., Fasoto, O.O., (2007). Prevalence and correlates of depression in late pregnancy among Nigerian women. *Depression and Anxiety* 24(1):15-21

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders,* (4th ed., text revision). American Psychiatric Association: Washington, DC

Baker, D., Taylor, H., (1997). The relationship between condition-specific morbidity, social support and material deprivation in pregnancy and early motherhood. ALSPAC Survey Team. Avon Longitudinal Study of Pregnancy and Childhood. *Social Science and Medicine* 45(9):1325-36.

Beck, C.T., & Gable, R.K. (2001). Further validation of the Postpartum Depression Screening Scale. *Nursing Research*, 50(3), 155-164.

Bennet, H.A., Einarson, A., Taddion, A., Koren, G., Einarson, T.R., (2004). Prevalence of depression during pregnancy: systematic review. *Obstetrics and Gynaecology,* 103 (4): 698-709

Blander J, Kaaya SF, Emmons K, Mbwambo J., Matsumoto K, Smith-Fawzi MC. (under review) A randomized control trial evaluating the effect of an interactive group counseling intervention for HIV positive women on prenatal depression

Bolton, P., Neugebauer, R., & Ndogoni, L. (2002). Prevalence of depression in rural Rwanda based on symptom and functional criteria. *Journal of Nervous and Mental Disorders*, 190(9), 631-637.

Bolton, P., Bass, J., Neugebauer, R., Verdeli, H., Clougherty, K.F., Wickramaratne, P., Speelman, L., Ndogoni, L., & Weissman, M. (2003). Group interpersonal psychotherapy for depression in rural Uganda: a randomized controlled trial. *Journal of the American Medical Association*, 289(23), 3117-3124.

Bolton, P., Wilk, C.M., & Ndogoni, L. (2004). Assessment of depression prevalence in rural Uganda using symptom and function criteria. *Social Psychiatry and Psychiatry Epidemiology*, 39(6), 442-447.

Brooks, J., Nathan, E., Speelman, C., Swalm, D., Jacques, A., & Doherty, D. (2009). Tailoring screening protocols for perinatal depression: prevalence of high risk across obstetric services in Western Australia. *Archives of Womens Mental Health*, 12(2), 105-112.

Cook, J.A., Grey, D., Burke, J., Cohen, M.H., Gurtman, A.C., Richardson, J.L., Wilson, T.E., Young, M.A., & Hessol, N.A. (2004). Depressive symptoms and AIDS-related mortality among a multisite cohort of HIV-positive women. *American Journal of Public Health*, 2004; 94:1133-1140.

Cox, J.L., Holden, J.M., Sagovsky, R., (1987). Detection of depression. Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 150:782-85

Dankner, R., Goldberg, R.P., Fisch, R.Z., & Crum, R.M. (2000). Cultural elements of postpartum depression. A study of 327 Jewish Jerusalem women. *Journal of Reproductive Medicine*, 45(2), 97-104.

Eberhard-Gran, M., Eskild, A., Tambs, K., Opjordsmoen, S., & Samuelsen, S.O. (2001). Review of validation studies of the Edinburgh Postnatal Depression Scale. *Acta Psychiatrica Scandinavica*, 104(4), 243-249.

Escobar, J.I., Interian, A., Diaz-Martinez, A., Gara, M. (2006). Idiopathic physical symptoms: a common manifestation of psychiatric disorders in primary care. *CNS Spectrums*, 11(3), 201-210.

Faisal-Cury, A., Menezes, R.P., (2007). Prevalence of anxiety and depression during pregnancy in a private setting sample. *Archives of Women's Mental Health,* 10(1): 25-32

Fatoye, F.O., Adeyemi, A.B., Oladimeji, B.Y., (2004). Emotional distress and its correlates among Nigerian women in late pregnancy. *Journal of Obstetrics and Gynaecology,* 24(5):504-509

Ferri, C.P., Mitsuhiro, S.S., Barros, M.C., Chalem, E., Guinsburg, R., Patel, V., Prince M., Laranjeira, R., (2007). The impact of maternal experience of violence and common mental disorders on neonatal outcomes: a survey of adolescent mothers in Sao Paulo, Brazil. *BMC Public Health*, 7: 209

First, M.B., Spitzer, R.L., Gibbon, M., Williams, J.B.W., Davies, M., Borus, J., Howes, M.J., Kane, J., Pope, H.G., Rounsaville, B., (1995). The Structured Clinical Interview for DSM-III-R Personality Disorders (SCID-II). Part II: Multi-site Test-retest Reliability Study. *Journal of Personality Disorders*, 9(2), 92-104

Fisher, J.R., Tran, H.T., & Tran, T. (2007). Relative socioeconomic advantage and mood during advanced pregnancy in women in Vietnam. *International Journal of Mental Health Systems*, 1(1); 3

Flynn, H.A., Walton M.A., Chermack, S.T., Cunningham, R.M., Marcus, S.M., (2007). Brief detection and co-occurrence of violence, depression and alcohol risk in prenatal care settings. *Archives of Women's Mental Health,* 10(4):155-61

Goldberg,D., and Huxley,P. (1980) Mental Illness in the Community. Tavistock, London.

Grace, J., Lee, K.K., Ballard, C., Herbert, M (2001) The relationship between post-natal depression, somatisation and behaviour in Malaysian women. *Transcultural Psychiatry,* 38(1): 27-34

Gureje, O., Simon, G.E., Ustun, T.B., Goldberg, D.P., (1997). Somatisation in cross-cultural perspective: a World Health Organization study in primary care. *American Journal of Psychiatry*, 154(7):989-95.

Haas, J.S., Jackson, R.A., Fuentes-Afflick, E., Stewart, A.L., Dean, M.L., Brawarsky, P., Escobar, G.J., (2005). Changes in the health status of women during and after pregnancy. *Journal of General Internal Medicine*, 20(1):45-51.

Hinton, W.L., Du, N., Chen, Y.C., Tran, C.G., Newman, T.B., & Lu, F.G. (1994). Screening for major depression in Vietnamese refugees: a validation and comparison of two instruments in a health screening population. *Journal of General Internal Medicine*, 9, 202-6.

Hofstede, G. (2001). Culture's consequences. Comparing values, behaviours, institutions and organisations across nations. Thousand Oaks, CA: Sage Publications

Holzman, C., Eyster, J., Tiedje, L.B., Roman, L.A., Seagull, E., Rahbar, M.H., (2006). A life course perspective on depressive symptoms in mid-pregnancy. *Maternal and Child Health Journal*, 10(2):127-38

Hui, C.H., Triandis, H.C., (1989). Effects of culture and response format on extreme response style. *Journal of Cross-Cultural Psychology,* 20, 296-309

Jinadu, M.K., & Daramola, S.M. (1990). Emotional changes in pregnancy and early puerperium among the Yoruba women of Nigeria. *International Journal of Social Psychiatry*, 36(2), 93-98.

Josefsson, A., Berg, G., Nordin, C., Sydsjö, G., (2001) Prevalence of depressive symptoms in late pregnancy and post-partum. *Acta Obstetricia Et Gynaecologica Scandinavica,* 80: 251-255

Kaharuza, F.M., Bunnell, R., Moss, S., Purcell, D.W., Bikaako-Kajura, W., Wamai, N., Downing, R., Solberg, P., Coutinho, A., & Mermin, J. (2006). Depression and CD4 cell count among persons with HIV infection in Uganda. *AIDS Behaviour*, 10(4 Suppl), S105-111.

Kazi, A., Fatmi, Z., Hatcher, J., Kadir, M.M., Niaz, U., & Wasserman, G.A. (2006). Social environment and depression among pregnant women in urban areas of Pakistan: importance of social relations. *Social Science and Medicine*, 63(6), 1466-1476.

Kazi, A., Fatmi, Z., Hatcher, J., Kadir, M.M., Niaz, U., Wasserman G.A., (2006). Social environments and depression among pregnant women in urban areas of Pakistan: Importance of social relations. *Social Science and Medicine,* 63(6): 1466-1476.

Kelly, J.A., Murphy, D.A., Bahr, G.R., Kalichman, S.C., Morgan, M.G., Stevenson, L.Y., Koob, J.J., Brasfield, T.L., & Bernstein, B.M. (1993). Outcome of cognitive-behavioral and support group brief therapies for depressed, HIV-infected persons. *American Journal of Psychiatry*, 150(11), 1679-1686.

Kelly, R.H., Russo, J., & Katon, W. (2001). Somatic complaints among pregnant women cared for in obstetrics: normal pregnancy or depressive and anxiety symptom amplification revisited? *General Hospital Psychiatry*, 23(3), 107-113.

Lau, Y., & Keung, D.W. (2007). Correlates of depressive symptomatology during the second trimester of pregnancy among Hong Kong Chinese. *Social Science and Medicine,* 64(9), 1802-1811.

Lee, B., Kaaya, S.F., Mbwambo, J.K., Smith-Fawzi, M.C., & Leshabari, M.T. (2008). Detecting depressive disorder with the Hopkins Symptom Checklist-25 in Tanzania. *International Journal of Social Psychiatry*, 54(1), 7-20.

Lee, D., Yip, A., Chiu, H., Leung, T., & Chung, T. (2001a). A psychiatric epidemiological study of postpartum Chinese women. *American Journal of Psychiatry*, 158(2), 220-226.

Lee, D.T., Yip, A.S., Chiu, H.F., Leung, T.Y., & Chung, T.K. (2001b). Screening for postnatal depression: are specific instruments mandatory? *Journal of Affective Disorders*, 63(1-3), 233-238.

Lovisi, G.M., Lopez, J.R., Coutinho, E.S., Patel, V., (2005). Poverty, violence and depression during pregnancy: a survey of mothers attending a public hospital in Brazil. *Psychological Medicine,* 35(10): 1485-92

Lutz C., (1985). Depression and the translation of emotional worlds. In Ed. Kleinman A, Good B. *Culture and Depression.* Berkeley: University of California Press.

Marcus, S.M., Flynn, H.A., Blow, F.C., Barry, K.L., (2003). Depressive symptoms among pregnant women screened in obstetrics settings. *Journal of Women's Health,* 12(4): 373-80

McKelvey, R.S., Webb, J.A. (1997). A prospective study of psychological distress related to refugee camp experience. *Australian and New Zealand Journal of Psychiatry*, 31, 549-54.

Menchetti, M., Murri, M.B., Bertakis, K., Bortolotti, B., & Berardi, D. (2009). Recognition and treatment of depression in primary care: effect of patients' presentation and frequency of consultation. *Journal of Psychosomatic Research*, 66(4), 335-341.

Ministry of Health and Social Welfare, (2006). *The United Republic of Tanzania, Tanzania Mainland: Mental Health Policy Guidelines.* Ministry of Health and Social Welfare: Dar es Salaam

Mollica, R.F., Wyshak, G., De Marneffe, D., *et al* (1987). Indochinese version of the Hopkins Symptom Checklist-25: A screening instrument for psychiatric care of refugees. *American Journal of Psychiatry*, 144, 497-500.

Pajulo, M., Savonlahti, E., Sourander, A., Helenius, H., Piha, J., (2001). Antenatal depression, substance dependency and social support. *Journal of Affective Disorders*, 65(1): 9-17

Patel, V., (2006). Cultural factors and international epidemiology. *British Medical Bulletin,* 57: 33-45.

Patel, V., Abas, M., Broadhead, J., Todd, C., & Reeler, A. (2001). Depression in developing countries: lessons from Zimbabwe. *British Medical Journal*, 322(7284), 482-484.

Poortinga, Y.H., Foden, B.I.M., (1975) A comparative study of curiosity in Black and White South African students. *Psychologia Africana.* Monograph Supplement, 8.

Ritter, C., Hobfoll, S.E., Lavin, J., Cameron, R.P., & Hulsizer, M.R. (2000). Stress, psychosocial resources, and depressive symptomatology during pregnancy in low-income, inner-city women. *Health Psychology*, 19(6), 576-585.

Rochat, T.J., Richter, L.M., Doll, H.A., Buthelezi, N.P., (2008). Depression amongst pregnant rural South African women undergoing HIV testing *Journal of The American Medical Association*, 295(12):1376-1378

Ross, L.E., Sellers, E.M., Gilbert Evans, S.E., & Romach, M.K., (2004). Mood changes during pregnancy and the postpartum period: development of a biopsychosocial model. *Acta Psychiatrica Scandinavica*, 109(6), 457-466.

Van der Kooi, R., Theobald S. (2006) Traditional medicine in late pregnancy and labour: perceptions of Kgaba remedies amongst the Tswana in South Africa. *African Ethnomedicines Network,* 3(1); 11-22

van de Vijver, F.J.R., Poortinga, Y.H. (1997) Towards and integrated analysis of Bias in cross-cultural assessment. *European Journal of Psychological Assessment,* 13(1): 29-37

Ware N. C., Christakis N. A., Kleinman A., (1992) An anthropological approach to social science research on the health transition. In Eds. Chen L. C., Kleinman A. and Ware N. *Advancing health in developing countries, the role of social research*. New York: Aurban House

Welte, J.W., & Russell, M. (1993). Influence of socially desirable responding in a study of stress and substance abuse. *Alcohol Clinical and Experimental Research*, 17(4), 758-761.

World Health Organization (1992) The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines. Geneva: World Health Organization.

Whyte, SR., (1991). Attitudes towards mental health problems in Tanzania. *Acta Psychiatrica Scandinavica* (Suppl.) 364:s59-76

Wissart, J., Parshad, O., Kulkarni, S., (2005). Prevalence of pre and postpartum depression in Jamaican women. *BMC Pregnancy and Childbirth* (5): 15

Yoshida, K., Marks, M.N., Kibe, N., Kumar, R., Nakano, H., & Tashiro, N. (1997). Postnatal depression in Japanese women who have given birth in England. *Journal of Affective Disorders*, 43(1), 69-77.

Young, K.P.H., (1995). *Understanding marriage: A Hong Kong case study*. Hong Kong: Hong Kong University Press

Summary

The focus of this thesis is depressive morbidity in low-income perinatal populations in Tanzania. Prevalence of perinatal depression is high and has been associated with functional impairments in affected women, adverse birth outcomes and short and longer term effects on a child's development. Being able to identify early symptoms of depression and availability of adequate instruments for the early diagnosis of depressive symptoms may inform the development of effective interventions for depression. Effective interventions for early recognition and treatment of perinatal depression could improve both perinatal women's quality of life, and their abilities to undertake self care health actions for themselves and their infants. The three core research questions posed by the thesis were (1) what idioms of distress are emphasized in recollections of women with prior experience of depressed mood (for at least two weeks) during pregnancy and do the derived expressions of distress have similarities to core features of a biomedical depressive syndrome? (2) What socio-demographic, economic and partner relationship factors are associated with significant depressive symptoms in HIV status naive pregnant women attending public primary health care facilities in Dar es Salaam? And (3) what effect does significant depressive symptoms, have on clinical indicators of progression of HIV disease and all cause mortality in women living with HIV and AIDS recruited from antenatal clinic settings in Dar es Salaam? The answers to these questions are intended to inform strengthening of psychosocial supports in the perinatal health care settings of Dar es Salaam specifically and Tanzania in general.

Chapter 1 provides a general introduction to the context in which the studies are conducted, by firstly providing an overview of mental health care resources in Tanzania, making the case for the need to transfer mental health care skills to non-mental health care professionals working at primary health care levels. Secondly a review of the magnitude of depressive disorder, showed a high variability in rates from studies in primary care settings of SSA (7.4% to 30.0%), with rates being 1.5 to 3 times higher in women. A review of epidemiological studies of perinatal depression emphasizes the reported high rates of postnatal depression, with rates during pregnancy shown to be as high or higher. Antenatal depression was a rather consistent predictor of postnatal depression suggesting a continuum of morbidity. In addition to individual constitutional factors, other reported risk factors for antenatal depression included low social support, history of abuse, socio-environmental adversity and anxiety. Fewer studies have explored the magnitude and risk factors of

perinatal depression in low-income countries, and none in Tanzania. However, qualitative studies in such contexts show more somatised presentations of depression in perinatal populations, and challenges to cross cultural measurement of perinatal depression are briefly discussed.

Chapter 2 describes a formative cross-sectional study that used unstructured interviews to explore women's experiences and expressions of distress during pregnancy. Key informants were identified based on having experienced during pregnancy, symptoms of depression similar to those that were described in a case vignette presented to traditional practitioners that had provided them with care. The findings showed socio-cultural institutions related to menarche and marriage, shaped women's understandings of causes of psychological distress during pregnancy. A "problematic pregnancy" construct was used by informants to frame both physical and psychological health concerns that were perceived to be inter-related. Though a single term that entirely captured described experiences with psychological distress did not emerge, *kusononeka* (conceptually translates to sadness as if grieved with slowness in undertaking actions/activities), was term consistently used to describe persistent sadness across more than one perceived cause of ill health during pregnancy. This experience was consistently reported with two somatic core features of major depression, loss of energy and fatigue, and a distinctive cultural idiom, "thinking too much". Other somatised presentations of distress including autonomic features of anxiety such as palpitations and sweating and pain symptoms such as headache, was common. Impairments in interpersonal interactions were often associated with prolonged sadness during pregnancy. In concluding a construct with similarities to biomedical criteria for major depression emerged from the narrative data. Somatised expressions of distress predominated and distinctive expressions and related functional impairments were identified that could inform adaption of depression screening tools.

Chapter 3 presents the analyses of a cross-sectional study of periurban antenatal clinic attendees that determined psychometric properties of the HSCL-25 and conducted pooled analysis of ethnographically derived local idioms of distress to explore the latter's utility in informing development of a culturally sensitive depression screening instrument. The chapter presents a hypothesis that instruments that include local idioms of distress may elucidate culturally sensitive expressions of depressive morbidity, not readily identified by standard instruments developed in a different cultural context. The results showed the HSCL-25 items were internally consistent statistically and over time, with adequate inter-rater reliability, convergent and discriminant validity. Logistic regression analysis was conducted using 30 local idioms pooled with 17 conceptually dissimilar HSCL-25 items. A 1.05 cut-off score on the pooled items scale serving as the dependent variable, effectively di-

vided participants into relatively equal numbers with higher and lower scores. The results showed a 19 item scale predicted 97.3% of this classification. Correlation analysis of this Dar es Salaam Symptom Checklist (DSQ) showed that items were relatively independent (*rho* -0.01 to 0.52), with adequate item to scale correlations ranging from 0.29 to 0.76 and other reliability statistics were similar to those derived with the HSCL-25. A core feature of major depression, experiencing sadness, was not a DSQ item. However, nine DSQ items endorsed by 10% or more participants included two core somatic features of depression, fatigue and low energy; and the experience of "needing to force oneself to do things" suggesting anhedonia. The remaining items were somatised expressions of distress including symptoms of pain and autonomic features of anxiety (cranial, cardiac and gastrointestinal). Most DSQ items converged well in factor analysis on a single factor. Further analysis showing five inter-related dimensions that each explained relatively similar variances in scale scores; including social withdrawal (12.6% variance), panic and confusion (11.9% variance), somatic symptoms (10.8% variance), anxiety symptoms (10.3% variance) and fatigue (9.4% variance). Using an arbitrarily defined cut-off of 1.4 to define symptom severity, the DSQ had higher proportions (15%) with scores above 1.4 than the HSCL-25 (10.8%). This may suggest DSQ items were more sensitive to symptom severity assessments. In concluding this chapter provides further evidence that understanding local idioms of distress may be useful in guiding conceptually meaningful adaptations of standardized depression screening tools.

Chapter 4 presents a validation and calibration study of the HSCL—25. Pregnant participants screening positive for HIV were recruited to a two-phased validation study of the Kiswahili version of the HSCL-25 that was adapted using an independent back translation approach supported by translator discussion panels. During the first phase, the HSCL-25, and other measures were administered. During the second phase, the Structured Clinical Interview for DSM-IV (SCID-Non Patient version) was independently administered to a stratified random sample of an equal number of participants with high and low HSCL-25 scores using the literature recommended cut-off score of 1.75. Findings showed 11 of 99 participants with completed SCID measures met DSM-IV criteria for major depression. Determination of HSCL-25 criterion validity showed eight HSCL-25 items, two that were from the anxiety subscale, distinguished depressed from non depressed participants at a much lower level(1.06) than the recommended cut-off score but with a higher specificity (85%) than the total scale (cut-off score 1.06, specificity 80%) or its 15-item depression subscale (cut-off score 1.03; specificity 79%). All three scale versions, showed similar sensitivity (89%). In concluding the chapter notes that though the revised HSCL scale supported prior observations of a tendency to emphasize some symptoms of anxiety in pregnant women's expression of depressive morbidity, none of the subscales were good at assessing depression severity. The need for further studies to establish

items that can improve depression severity assessment in Tanzanian perinatal women is discussed.

Chapter 5 addresses determination of the prevalence of depressive morbidity and selected socio-demographic and partner relationship factors associated with depression in second to third trimester pregnant women attending periurban primary health care facilities. Depression, socio-economic, and selected physical and psychological health measures were assessed at recruitment. To minimize the effects of depressive morbidity at recruitment on participant's responses, the quality of partner relationships and social support over the past 12 months was assessed at a follow-up interview 4-6 months later. Completed prenatal assessments available for 76% of 787 women, showed a 39.5% prevalence of significant depressive symptomatology. As has been shown by other studies, multivariate analysis adjusted for socio-demographic risk factors, showed previous depressive episodes, moderate satisfaction with ability to access basic needs, conflicts with the current partner and early booking for antenatal care were independently associated with antenatal depression. The minimal wealth differentials in the sample are put forwards as a possible reasons for the lack of association between depression and objective measures of household wealth status. Somatised presentations of distress may account for associations between early booking for antenatal care and depression, providing both a depressive morbidity recognition challenge and opportunity for intervening. Despite methodological limitations, the chapter concludes that interventions for early recognition of depression should target women with history of previous depressive episodes or low satisfaction with ability to access basic needs, conflict in partner relationships and relatively earlier booking for antenatal care. The integration of screening for depression in routine antenatal care is recommended.

Chapter 6 addresses the impact of perinatal depression in a setting of high prevalence of HIV disease. The study summarizes findings of a psychosocial sub-study of a trial that examined in 996 HIV-positive Tanzanian women, micronutrients and pregnancy outcomes, vertical transmission and disease progression. Depression and social support were measured two months after HIV screening and every six months for five years of the eight year follow-up period and 12 monthly thereafter. Depression as an independent predictor was allowed to vary over time intervals during the analyses and only measures during pregnancy and more than 12 months post-delivery were included in the analysis to remove the effects of postnatal depression. The effect of depression on progression to WHO HIV clinical stages III and IV and all cause mortality throughout a 6-8 year follow-up period was estimated. Participation in group or individual counselling as well as perceived social support at baseline was also examined. As has been found by other studies amongst HIV positive women in ambulatory clinical settings, more than half (57%) of the study sample had signifi-

cant depressive morbidity on at least one assessment during the follow-up period. Controlling for socio-demographic variables, psychosocial support, and clinical condition at enrolment, depression was associated with a 61% [HR=1.61, 95% CI: 1.28, 2.03] increased risk of progression to HIV clinical stage III/IV and an almost three [HR=2.65, 95% CI: 1.89, 3.71] time increased risk of mortality. In concluding the study shows depression is common among HIV-infected Tanzanian women and increases the risk of disease progression. The chapter concludes on the need to screen for depression both at the time of HIV diagnosis and as part of ongoing clinical assessments and interventions during comprehensive HIV and AIDS care.

Chapter 7 encompasses a general discussion of the whole thesis. First, it discusses the major findings in relation to the research questions leading to a number of general conclusions. Firstly, that experience of prolonged sadness during pregnancy can be elicited on inquiry, despite not being spontaneously reported. Despite an emphasis on somatic presentations of distress, on systematic inquiry these symptoms were not associated with common pregnancy related physical health problems such as malaria and anaemia, suggesting their utility in recognizing depression in spite of the potential for overlap with physical health concerns. When somatic anxiety and depression is considered with unique expressions of distress and questioning regarding experiences of prolonged sadness, a biomedical depressive syndrome was recognizable in women's idioms of distress. Secondly the findings showed prevalence of depressive morbidity during late pregnancy was high in antenatal clinic attendees at primary health care levels, and when women were positive for HIV infection, more than half experienced an episode of depression at least once over a median follow-up duration of 6 years. Previous depressive episodes were the strongest predictor of depressive morbidity during pregnancy with other independent risk factors including low satisfaction with financial ability to access basic needs, conflicts with a current intimate partner and earlier booking for antenatal care. Finally, the studies show that experiencing a depressive episode when HIV positive, was associated with a more rapid clinical progression of HIV disease and a higher risk of all cause mortality. The chapter further elaborates on methodological problems including the potential for recall bias when utilizing a five year recall period to elicit key informant's experiences of distress during pregnancy. Participant difficulty in verbally expressing intensity of emotional concerns with provided Likert scales or more generally in self-evaluations of symptom severity was notable for particularly items on the HSCL-25. The scope of the studies only allowed speculation on the possible reasons; including use of Likert scales in a research naïve population and extent to which items were true to culture specific forms of symptom severity expressions. The reported findings related to local adaptation of depression screening instruments can at best be viewed as a preliminary step to a process that makes more evident areas for future inquiry. Recruitment of pregnant women in primary

care settings had limitations in a setting where booking late for antenatal care is the norm, restricting the timing of depression assessments to mid and late pregnancy. Challenges in determination of causal links from cross-sectional analyses are discussed. Finally, the absence of random assignment of participants to clinic based psychosocial interventions is discussed as this limited systematic determination of their buffering effects on the relationships between depressive morbidity and HIV disease progression and vital status outcomes in HIV positive pregnant women followed up over time. The chapter concludes with service implications of the findings and recommendations for operations/intervention research, methodological research, and other studies.

Samenvatting (Summary in Dutch)

Dit proefschrift richt zich op een analyse van de omvang en aard van een depressie kort voor en na de geboorte van een kind in Tanzania, onder populaties met een laag inkomen. Een depressie in de periode kort voor en na de geboorte komt veel voor en wordt in verband gebracht met functionele beperkingen en slechte uitkomsten van de bevalling, bijvoorbeeld negatieve effecten voor de ontwikkeling van het kind. Het tijdig kunnen onderkennen van een depressie en de beschikbaarheid van geschikte instrumenten om vroege symptomen van depressie te diagnosticeren, zijn van belang voor de ontwikkeling van effectieve interventies voor een depressie. Effectieve interventies voor vroege diagnose en behandeling van een depressie rondom de bevalling, kunnen bijdragen aan een verbetering van de kwaliteit van leven van deze vrouwen en kunnen hun vaardigheden verbeteren voor zelfzorg en gezondheidsgedrag, gericht op henzelf en hun kinderen. De drie hoofdvragen die in dit proefschrift zijn gesteld, waren (1) Welke uitdrukkingen van verdriet en pijn komen naar boven in de verhalen of herinneringen van vrouwen die eerder een depressieve gemoedstoestand van ten miste 2 weken hebben gehad; (2) Welke sociaal-demografische, en economische kenmerken en kenmerken van de relatie met de partner hangen samen met symptomen van een depressie bij vrouwen die in verwachting zijn en die niet op de hoogte zijn van hun eigen HIV-status; (3) Wat is de invloed van belangrijke depressieve symptomen op klinische indicatoren voor de ontwikkeling van een HIV-infectie en op het aantal sterfgevallen bij vrouwen die geïnfecteerd zijn met HIV. De antwoorden op deze vragen kunnen bijdragen aan interventies gericht op het versterken van psychosociale begeleiding door zwangerschapsinstellingen in Tanzania in het algemeen en in Dar es Salaam in het bijzonder.

In hoofdstuk 1 wordt de context waarin de verschillende studies die in dit proefschrift zijn beschreven, geïntroduceerd met eerst een overzicht van de mogelijkheden in Tanzania voor geestelijke gezondheidszorg. Verder wordt de overdracht van vaardigheden op het gebied van geestelijke gezondheidszorg naar professionals in de 1^{e} lijnszorg die zelf niet deskundig zijn in de geestelijke gezondheidszorg, bepleit. Een overzicht van studies naar de omvang van het vóórkomen van depressie in landen beneden de Sahara, laat een grote variatie zien van depressie in diverse settings van gezondheidszorg in de eerste lijn (van 7.4% tot 30.0%) waarbij het vóórkomen van depressie bij vrouwen 1,5 tot 3 maal hoger ligt dan bij mannen. Een overzicht van epidemiologisch onderzoek in

diverse landen naar een depressie rondom de bevalling, bevestigt het hoge percentage post natale depressies, en ook even hoge of nog hogere percentages depressie tijdens de zwangerschap. Prenatale depressie bleek een tamelijk constante voorspellende factor te zijn voor post natale depressie, hetgeen wijst op een continuüm in morbiditeit. In aanvulling op persoonsgebonden factoren zijn er andere risicofactoren, met name lage sociale steun, een geschiedenis van (seksueel)misbruik, tegenslagen in de sociale omgeving en angst. Weinig epidemiologische studies zijn verricht in lage lonen landen naar de omvang van en de risicofactoren voor een depressie rondom de bevalling en geen enkele studie werd verricht in Tanzania. Echter, kwalitatief onderzoek in dergelijke landen wijst op vooral somatische presentaties van depressie bij populaties van vrouwen rondom de bevalling. Verder worden in dit hoofdstuk de problemen bij het meten van depressie rondom de bevalling in een cross-culturele context, besproken.

In hoofdstuk 2 wordt een formatief cross-sectioneel onderzoek beschreven waarbij ongestructureerde interviews werden gehouden om de ervaringen van vrouwen en de uitdrukkingen van stress tijdens de zwangerschap te inventariseren. Hiervoor werden sleutelinformanten geïdentificeerd onder vrouwen die eerder stress-symptomen tijdens de zwangerschap hadden gehad. Daarbij ging het om symptomen zoals die worden beschreven in een 'case-vignette' onderzoek dat werd uitgevoerd onder artsen in Tanzania. De resultaten lieten zien dat sociale instituties die gerelateerd zijn aan de eerste menstruatie en het huwelijk, van invloed waren op het begrip van vrouwen van de oorzaken van psychische stress tijdens de zwangerschap. Het concept van "een problematische zwangerschap" werd door informanten gebruikt om fysieke en psychische problemen die werden ervaren als onderling samenhangend, te begrijpen. Hoewel niet één enkele uitdrukking of term werd gevonden die het geheel van beschreven ervaringen van psychische stress omvatte, werd de term *kusononeka* consistent gebruikt om aanhoudende neerslachtigheid als oorzaak van verschillende gezondheidsproblemen tijdens de zwangerschap te benoemen. Deze ervaring werd consistent genoemd in samenhang met twee centrale kenmerken van een klinische depressie, te weten moeheid en futloosheid en het cultureel specifieke begrip van "teveel nadenken" (piekeren). Andere veel voorkomende uitdrukkingen van stress betroffen gesomatiseerde kenmerken van angst en pijn, bijvoorbeeld hartkloppingen en zweten. Problemen in inter-persoonlijke relaties werden vaak in verband gebracht met aanhoudende neerslachtigheid tijdens de zwangerschap. We kunnen concluderen dat uit de verhalen van de vrouwen een construct naar voren komt dat overeenkomsten vertoont met de

biomedische criteria voor een klinische depressiviteit. Vooral gesomatiseerde uitdrukkingen van stress werden genoemd. In het onderzoek werden opvallende kenmerken van een depressie met daaraan gerelateerde problemen, geïdentificeerd die gebruikt kunnen worden voor de aanpassing en ontwikkeling van screeningsinstrumenten voor depressie.

In hoofdstuk 3 wordt de analyse beschreven van een cross-sectioneel onderzoek onder bezoekers van een ziekenhuis in Dar es Salaam waarbij de psychometrische kenmerken van de HSCL-25 werden bepaald. Verder werd een geïntegreerde analyse uitgevoerd op data verkregen met een instrument dat werd samengesteld uit items van de HSCL-25, aangevuld met items verkregen uit een etnografisch onderzoek naar uitdrukkingen van stress, met als doel te komen tot een cultureel sensitief screeningsinstrument voor depressie. In dit hoofdstuk wordt de hypothese geformuleerd dat instrumenten die gebruik maken van locale terminologie om stress uit te drukken, kunnen helpen bij het verhelderen van cultureel sensitieve uitdrukkingen van depressieve problemen. Deze kunnen normaal niet geïdentificeerd worden met behulp van gestandaardiseerde instrumenten die ontwikkeld zijn in een andere culturele context. De resultaten lieten zien dat de HSCL-25 items intern consistent waren en consistent waren met het verloop van de tijd en verder dat er sprake was van een voldoende inter-beoordelaar betrouwbaarheid, convergerende validiteit en discriminerende validiteit. Een logistische regressie analyse werd uitgevoerd met 30 lokale stress items en 17 conceptueel verschillende items van de HSCL-25 als indicatoren (voorspellers). De afhankelijke variable hierbij was de gedichotomiseerde totaalscore (cut-off score 1.05) van HSCL-items en 30 lokale stress-items gecombineerd. Dit resulteerde in een schaal van 19 items die 97.3% van de variantie in de klassificatie voorspelden. Een correlatieanalyse van deze Dar es Salaam Symptom Checklist (DSQ) liet zien dat de items relatief onafhankelijk waren (rho -0.01 tot 0.52) met adequate item-totaalcorrelaties van 0.29 tot 0.76. Andere betrouwbaarheidsmetingen waren vergelijkbaar met de betrouwbaarheidsmetingen die over het algemeen worden verkregen met de HSCL-25. Een centraal kenmerk van een klinische depressie, bedroefd zijn, was geen item in de DSQ. Echter, onder de negen items van de DSQ die werden gescoord door 10% of meer van de participanten, waren twee items die een centraal kenmerk vormen van een depressie, moeheid en futloosheid, evenals de ervaring van “zichzelf moeten dwingen om dingen te doen”, hetgeen een aanwijzing is voor anhedonia, het niet meer kunnen genieten van normale dingen van het leven. De rest van de items betroffen gesomatiseerde uitdrukkingen van stress waaronder pijn en autonome kenmerken van angst, zoals hoofdpijn, hartkloppingen en maag-

en darmverstoringen. De meeste DSQ-items vormen één factor in een factor-analyse. Verdere analyse laat vijf onderling gerelateerde sub-dimensies zien die ieder ongeveer evenveel van de variatie in de totaalscore bepalen, te weten zich sociaal terugtrekken (12.6% variantie), verwarring en paniek (11.9% variantie), somatische symptomen (10.8% variantie), angst symptomen (10.3% variantie) en moeheid (9.4% variantie). Bij toepassing van een willekeurige splitsing in twee groepen bij een gemiddelde schaalscore van 1.4 om de sterkte van stress symptomen te bepalen laat de DSQ een hoger percentage zien (15%) met scores boven de 1.4 dan de HSCL-25 (10.8%). Dit kan er op wijzen dan de DSQ items sensitiever zijn bij het meten van de ernst van symptomen. Samenvattend kan gezegd worden dat dit hoofdstuk een verdere onderbouwing geeft voor de veronderstelling dat het begrijpen van lokale concepten voor stress nuttig kan zijn voor conceptueel betekenisvolle aanpassingen van gestandaardiseerde instrumenten voor het meten van een depressie.

In hoofdstuk 4 wordt een onderzoek beschreven waarin de HSCL-25 werd gevalideerd en aangepast voor toepassing in het Kiswahili. Vrouwen die in verwachting waren en die HIV-positief waren, werden gerekruteerd voor een 2-fase valideringsonderzoek van de Kiswahili versie van de HSCL-25 waarbij gebruik werd gemaakt van een onafhankelijke terugvertaalprocedure, ondersteund door discussiepanels van vertalers. In de eerste fase werden de HSCL-25 en andere meetinstrumenten gebruikt. In de tweede fase vond een onafhankelijke toepassing plaats van een gestructureerd klinisch interview voor de DSM-IV (SCID-Non Patient version) bij een gestratificeerd random sample van gelijke aantallen van vrouwen met een hoge en een lage score op de HSCL-25 (met een onderscheid tussen hoger en lager bij een score van 1.75). De resultaten lieten zien dat 11 van de 99 participanten voor wie SCID scores beschikbaar waren, volgens de DSM-IV geclassificeerd werden als klinisch depressief. Bepaling van de criterium validiteit van de HSCL-25 liet zien dat acht HSCL-items, waarvan twee in de subschaal voor angst, de depressieve van de niet-depressieve participanten onderscheidden op een veel lager score-niveau (1.06) dan het in de literatuur aanbevolen niveau, maar met een hogere specificiteit (85%) dan de HSCL totaal score (cut-off score 1.06; specificiteit 80%) of de 15-items depressie subschaal (cut-off score 1.03; specificiteit 79%). De drie versies van de schaal vertoonden een vergelijkbare sensitiviteit. (89%). Samenvattend kan worden geconcludeerd dat (1) het onderzoek met de herziene versie van de HSCL schaal eerdere observaties ondersteunt dat in de uitingen van problemen bij een depressie van de vrouwen, symptomen van angst een belangrijke rol spelen en (2) dat geen van de subschalen van deze versie zeer goed was in het meten van de

ernst van depressie. Verder wordt in dit hoofdstuk de behoefte aan verder onderzoek naar items die het meten van de ernst van depressie bij Tanzaniaanse vrouwen rondom de bevalling kunnen verbeteren, besproken.

In hoofdstuk 5 wordt onderzoek gerapporteerd naar de prevalentie van depressieve problemen en van de sociaaldemografische factoren en factoren van de relatie met de partner die samenhangen met depressieve problemen, onder vrouwen die in het tweede en derde trimester van hun zwangerschap zijn en die 1e lijnsgezondheidsinstellingen in stedelijke buitenwijken van Dar es Salaam bezoeken. Depressie, sociaaleconomische kenmerken en geselecteerde fysieke en psychische gezondheidsindicatoren werden gemeten bij de rekrutering. Om bij de rekrutering de invloed van effecten van depressieve problemen op de antwoorden van participanten te minimaliseren, werden gegevens over de kwaliteit van de relatie met de partner en sociale steun gedurende de laatste 12 maanden gemeten tijdens een follow-up interview dat 4 tot 6 maanden later werd gehouden. Prenatale metingen die beschikbaar waren voor 76% van de 787 vrouwen, lieten zien dat 39.5% van de participanten belangrijke depressieve symptomen vertoonde. Zoals ook in eerder onderzoek is vastgesteld, bleek uit multivariate analyses waarbij werd gecontroleerd voor sociaaldemografische risicofactoren, dat eerdere episodes van depressiviteit, matige tevredenheid met de mogelijkheden om in primaire behoeften te voorzien, conflicten met de huidige partner en vroege inschrijving voor post natale zorg, onafhankelijk geassocieerd bleken te zijn met post natale depressie. De beperkte welstandsverschillen tussen de vrouwen in het onderzoek verklaren mogelijk waarom er geen relatie werd gevonden tussen depressie en objectieve indicatoren voor de economische levensstandaard. Gesomatiseerde uitingen van stress zijn mogelijk verantwoordelijk voor de associatie tussen vroegtijdig inschrijven voor postnatale zorg en depressie. Ondanks methodologische beperkingen kan geconcludeerd worden dat interventies voor de vroege opsporing van depressie zich zouden moeten richten op vrouwen die eerder depressieve periodes hebben gehad, op vrouwen met een lage tevredenheid met de eigen mogelijkheden om in primaire behoeften te kunnen voorzien, op vrouwen die conflicten met hun partner hebben en op hen die zich vroegtijdig aanmelden voor post natale zorg. Er wordt aanbevolen om de screening voor depressie te integreren in de standaard voor post natale zorg.

In hoofdstuk 6 wordt bestudeerd wat de invloed is van depressie op de ontwikkeling van een HIV-infectie en op de mortaliteit bij HIV-positieve vrouwen na een bevalling. Het onderzoek beschrijft de resultaten van een psychologische

deelstudie uit een trial waarin 996 HIV-positieve Tanzaniaanse vrouwen werden onderzocht op micronutriënten en zwangerschapsresultaten, verticale HIV transmissie en voortschrijding van de ziekte. Depressie en sociale steun werden 2 maanden na de HIV-screening gemeten en vervolgens iedere 6 maanden gedurende een periode van 5 jaar en daarna 3 jaar met een tussenperiode van 1 jaar. De participatie in groepscounseling en individuele counseling evenals ervaren sociale steun bij de eerste meting, werden ook bestudeerd. Zoals ook blijkt uit andere studies onder HIV-positieve vrouwen die ambulante gezondheidsinstellingen bezoeken, bleek meer dan de helft (57%) van de participanten in het onderzoek belangrijke depressieve problemen te ervaren bij tenminste één van de meetmomenten tijdens de follow-up periode. Wanneer gecontroleerd werd voor sociaal-demografische variabelen, sociale steun en gezondheidstoestand bij de aanvang van de studie, bleek depressie geassocieerd te zijn met een toename van het risico met 61% [HR=1.61, 95% CL:1.28,2.03] op voortschrijding van de HIV-klinische fases II en IV en een bijna drie maal grotere kans [HR=2.65, 95% CI:1.89 3.17]op overlijden. Uit het onderzoek kan geconcludeerd worden dat depressie algemeen is onder met HIV geïnfecteerde Tanzaniaanse vrouwen, wat de kans op voortschrijding van de ziekte doet toenemen. Geconcludeerd wordt dat er een behoefte is aan screening op depressie bij de diagnose van de HIV infectie en ook als onderdeel van de klinische metingen en interventies tijdens het gehele proces van zorg.

In hoofdstuk 7 wordt een algemene discussie van het onderzoek in dit proefschrift beschreven. De belangrijkste bevindingen in relatie tot de onderzoeksvragen worden besproken, hetgeen leidt tot een aantal algemene conclusies. Ten eerst, dat door onderzoek het ervaren van een voortdurend verdriet gedurende de zwangerschap kan worden vastgesteld, hoewel dergelijke ervaringen niet spontaan worden gerapporteerd. Ondanks dat gesomatiseerde uitdrukkingen van stress in de Tanzaniaanse context veel vóórkomen, blijkt dat gewone fysieke gezondheidsproblemen zoals malaria en bloedarmoede niet geassocieerd worden met depressieve problemen. Dit geeft aan dat gesomatiseerde uitdrukkingen van stress gebruikt kunnen worden voor het onderkennen van een depressie, ondanks de potentiële overlap met fysieke gezondheidsproblemen. In de uitdrukkingen die vrouwen gebruiken om hun ervaring van stress duidelijk te maken, valt een biomedisch depressie syndroom te onderkennen. Ten tweede laten de resultaten een hoge prevalentie zien van depressieve problemen tijdens de late zwangerschap bij vrouwen die post nataal een gezondheidsinstelling van de 1e lijnszorg bezoeken. Van de HIV-positieve vrouwen die in verwachting waren en een 1e lijns gezondheidszorginstelling bezochten, blijkt

meer dan de helft van de vrouwen ten minste één depressieve periode te ervaren in een tijd van 6 jaar na de bevalling. Eerdere periodes van depressiviteit blijken de sterkste voorspeller te zijn voor depressie problemen tijdens de zwangerschap met als andere onafhankelijke factoren een lage tevredenheid met het kunnen voorzien in primaire levensbehoeften, conflicten met de huidige primaire partner en vroegtijdige inschrijving voor post natale zorg. Tenslotte laten de studies zien dat het ervaren van een depressieve periode bij HIV geïnfecteerde vrouwen, samenhangt met snellere progressie van de ziekte (HIV) en een grotere kans om vroegtijdig te overlijden. Verder worden in dit hoofdstuk methodologische problemen van onderzoek besproken zoals de mogelijkheid van "recall bias" wanneer onderzoek wordt gedaan om over een periode van vijf jaar na de bevalling ervaringen van stress tijdens de zwangerschap bij sleutelinformanten te meten. De participanten blijken het moeilijk te vinden om uitdrukking te geven aan de intensiteit van ervaren emotionele problemen door middel van Likert-schalen of meer in het algemeen in zelfevaluaties van de ernst van symptomen, in het bijzonder bij bepaalde items van de HSCL-25. Vanwege de aard en omvang van de studies kan alleen gespeculeerd worden over de mogelijke oorzaken hiervan. Deze zouden gelegen kunnen zijn in de toepassing van Likert-schalen bij een populatie met geen of nauwelijks ervaring met wetenschappelijk onderzoek en in de mate waarin items beantwoorden aan cultuurspecifieke vormen voor het uitdrukken van ernst van de symptomen. De resultaten met betrekking tot de lokale aanpassing van screeningsinstrumenten voor het meten van een depressie kunnen hooguit gezien worden als een preliminaire stap in een proces waarbij gebieden voor nader onderzoek worden aangeduid. De werving voor onderzoek van in verwachting zijnde vrouwen in zorginstellingen in de 1e lijn, heeft eveneens zijn beperkingen omdat in deze instellingen het laat inschrijven voor zwangerschapscontrole eerder de norm is dan de regel, waardoor de tijd voor het meten van depressie wordt beperkt tot de middenperiode en late periode van de zwangerschap. Eveneens worden de moeilijkheden bij het bepalen van causale relaties in cross-sectioneel onderzoek besproken. Tenslotte wordt het niet toepassen van random toewijzing van participanten aan psychosociaal onderzoek in een klinische setting, besproken. Het hoofdstuk wordt afgesloten met conclusies over de implementatie van bevindingen voor de prenatale en post natale zorg en aanbevelingen voor operationeel onderzoek en voor interventies.

About the Author

Name	**Sylvia Flirence Kaaya**
Nationality	Tanzanian
September 4, 1960	Date of birth
1973-1978	Ordinary and advanced levels secondary education
1980-1985	Faculty of Medicine, University of Dar es Salaam, Tanzania - Doctor of Medicine
1988-1990	Victoria University of Manchester, Britain - Diploma in Clinical Psychiatry - Masters of Science in Medicine (Psychiatry)
1990-1995	Lecturer in the Department of Psychiatry, Faculty of Medicine, University of Dar es Salaam
1995-	Senior Lecturer in the Department of Psychiatry, School of Medicine, Muhimbili University of Health and Allied Sciences, Dar es Salaam
1996-2009	Head, Department of Psychiatry and Mental Health, School of Medicine, Muhimbili University of Health and Allied Sciences, Dar es Salaam
1998-	Coordinator, Postgraduate Psychiatry Program, Department of Psychiatry and Mental Health, School of Medicine, Muhimbili University of Health and Allied Sciences, Dar es Salaam
2001-	PhD student, Faculty of Health, Medicine and Life Sciences, University of Maastricht, the Netherlands