

EXPLANATORY MODELS OF MENTAL DISTRESS AND
INFLUENCING FACTORS IN A MULTI-CULTURAL SETTING,
KHARTOUM, SUDAN.

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Abstract

Title: Explanatory models of mental distress and influencing factors in a multi-cultural setting, Khartoum, Sudan.

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Background: It has been recognized that explanatory models (EMs) of mental distress play an important role in how people perceive causes of mental illness, how these illnesses are presented and where treatment is sought. The main objective of this study was to explore EMs within a non-clinical sample in a low-income and multicultural setting and to identify the most common category of EMs. The secondary objectives were to assess the influence of demographic factors, perceived accessibility of health services, and choice of health service for mental distress across the EM categories.

Methods: Cross-sectional data were collected using the Mental Distress Explanatory Model Questionnaire (MDEMQ) from 399 participants resident in Mayo, Khartoum. The frequency distribution across different EMs was assessed to reveal the most common EMs and category of EMs. Frequencies of perceived accessibility were conducted to identify the preferred health service. Predictive Analytic SoftWare Statistics (PASW) Version 18 was used for all analysis.

Results: The most prevalent EMs of mental distress were found to be in the category of stress, but supernatural/magical EMs were also prevalent in the sample. Factors significantly associated with the EM categories stress and supernatural were found to be area of origin and years since migration from the area of origin. Choice of health service was not found to be significantly associated with EMs, with 84 % of the sample choosing hospital as their first choice for mental illness.

Conclusion: Cultural beliefs of mental distress are important to recognize to facilitate positive interactions between health workers and the patient. Findings from this study indicates that both western and non-western EMs are prevalent in Mayo, which suggests a heterogeneous approach to EMs of mental distress, and that beliefs in one EM category not automatically excludes other categories of EMs.

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Table of Contents

LIST OF TABLES.....	VII
ABBREVIATIONS	VIII
PREFACE.....	1
CHAPTER 1 - INTRODUCTION.....	3
1.1. Background.....	3
1.1.1. Global mental health	3
1.1.2. Mental health in the Arab world	4
1.2. Sudan.....	5
1.2.1. Country background	5
1.2.2. Culture and migration	7
1.2.3. Health policies.....	8
1.3. Study site	9
1.3.1. Sudan Mental Health Project.....	9
CHAPTER 2 – LITERATURE REVIEW	11
2.1. Mental health in Sudan	11
2.2. Cultural psychiatry.....	12
2.3. Explanatory models.....	12
2.4. Factors influencing explanatory models.....	15
2.4.1. Socio-demographic factors.....	15
2.4.2. Cultural factors	15
2.4.3. Education and accessibility of service	16
2.5. EMs of Sudanese populations.....	18
2.6. Ways of examining explanatory models	18
2.7. Rationale for study	19
2.8. Conceptual Framework and Objectives	20
2.8.1. Conceptual framework	20
2.8.2. Objectives	20
2.8.3. Study Questions.....	20
CHAPTER 3 - METHODOLOGY	21
3.1. Study Design and sampling.....	21
3.1.1. Sampling.....	21
3.2. Research tools	22
3.2.1. Accessibility	22
3.2.2. The Mental Distress Explanatory Model Questionnaire	22
3.3. Translation, training and pilot	23
3.3.1. Translation	23
3.3.2. Training.....	23
3.3.3. Cultural validation.....	24
3.3.4. Pilot.....	24
3.4. Data Collection.....	25
3.5. Data Handling and Analysis	25
3.5.1. The reliability of the MDEMQ.....	26
3.5.2. Categorization	27
3.5.3. Analysis.....	27
3.5.4. Outcome variables	28
3.6. Ethical Considerations.....	28
3.6.1. Benefits to the participants	28
3.6.2. Risks	29

3.6.3.	Withdrawal	29
3.6.4.	Confidentiality.....	29
CHAPTER 4 – RESULTS		30
4.1.	Sample description	30
4.1.1.	Demographic characteristics	30
4.1.2.	Frequency distribution perceived accessibility of health facility.....	32
4.1.3.	Explanatory models distribution.....	32
4.2.	Demographic variables, accessibility and EM.....	36
4.2.1.	Socio-demographic factors.....	36
4.2.2.	Cultural factors.....	38
4.2.3.	Education and income factors	40
4.2.4.	Health service use and satisfaction	41
CHAPTER 5 – DISCUSSION.....		44
5.1.	Summary of key findings.....	44
5.2.	Explanatory models distribution.....	44
5.2.1.	Stress.....	44
5.2.2.	Physiology.....	45
5.2.3.	Supernatural	46
5.2.4.	Demographic factors	46
5.2.5.	Cultural factors.....	47
5.2.6.	Educational and income factors	48
5.2.7.	Health service factors.....	49
5.3.	Health service utilization.....	50
5.4.	Methodological issues	51
5.4.1.	Validity	51
5.4.2.	Reliability.....	54
5.4.3.	The use of the concept explanatory models	56
5.5.	Limitations and strengths.....	58
CHAPTER 6 – CONCLUSION		60
6.1.	Conclusion	60
6.2.	Recommendations and suggestions.....	60
6.3.	Contribution to knowledge	61
REFERENCES.....		62
APPENDIX I: ENGLISH VERSION OF THE QUESTIONNAIRES.....		69
APPENDIX II: ARABIC VERSION OF THE MDEMQ.....		76

List of Tables

Table 3.1. Reliability of the MDEMQ.....	26
Table 4.1. Socio demographics continuous variables	30
Table 4.2. Socio demographics categorical variables	30
Table 4.3. Perceived accessibility of health services	32
Table 4.4. Frequencies MDEMQ category stress	33
Table 4.5. Frequencies MDEMQ category Western physiology	34
Table 4.6. Frequencies MDEMQ category non-Western physiology	34
Table 4.7. Frequencies MDEMQ category supernatural	35
Table 4.8. MDEMQ categories across socio-demographic factors.....	36
Table 4.9. MDEMQ categories across cultural factors	38
Table 4.10. MDEMQ categories across education/income factors.....	40
Table 4.11. MDEMQ categories across health service use.....	41

Abbreviations

EM – Explanatory Model

FMoH – Federal Ministry of Health

IDP – Internally Displaced Person

MDEMQ – Mental Distress Explanatory Model Questionnaire

NWP – Non-Western Physiology

SMHP – Sudan Mental Health Project

SN - Supernatural

WP – Western Physiology

Preface

“No health without mental health” has become a slogan and statement used by the World Health Organization (WHO), along with other major organizations across the world. This statement suggests that for a person to be considered healthy, they also must be able to cope with life stresses and work and be able to contribute to the world and the people around them.

Several different conditions, such as a safe environment, sustainable work, and having essential needs covered, may enhance or ensure the mental well-being. Regrettably, these conditions are not always present, depending on the resources of both the individual and the world surrounding them. For this reason, mental health services and educated health providers are a necessity to promote mental health in populations. This requires a significant amount of knowledge and resources to solve mental health problems in the best manner possible. However, in many parts of the world mental health is still not acknowledged as an area for prioritization, and mental health services remain scarce.

People from different cultures and backgrounds may have different explanations for their illness, which might influence their help-seeking behavior. Because mental health and the beliefs tied to it are dependent upon the context in which they exist, it is important to explore the beliefs of those living in the same context as the health services are being provided in, as well as the factors that influence these beliefs. This is particularly important if the population is under-served by health services, and the people working in these services live very different lives to their patients.

The current study is important due to the recent focus on mental health in Khartoum, Sudan, through the Sudan Mental Health Project, as well as the research supporting the theory that the causal beliefs of an illness will influence whether services are sought and if they are perceived to be adequate and appropriate. It is also important to raise awareness about causal beliefs and their impact in general, and which causal beliefs are prevalent specifically.

This thesis consists of six chapters, with the first chapter describing the global and national impact of mental health, and taking a closer look at Sudan and the study site. Chapter 2 provides the literature review regarding mental health in Sudan. Transcultural psychiatry is then briefly presented followed by a more extensive review of explanatory models (EMs), the factors influencing these and EMs in Sudan. Further, the different instruments and methods used to assess EMs are presented, before the rationale, conceptual framework and the

objectives of this study. Chapter 3 provides a description of the methodology chosen for this study, along with ethical considerations, while Chapter 4 presents the results. Chapter 5 provides the reader with a discussion of the findings, before the conclusions and recommendations for further research and stakeholders are presented in chapter 6.

Chapter 1 - Introduction

1.1. Background

1.1.1. Global mental health

In 2008, the World Health Organization (WHO) published a report stating that physical and mental health "...are inseparable in terms of achieving a more complete state of wellness" (1, pp 1). Mental health has, in the last couple of decades, been granted more and more interest and attention, which is mirrored in the WHO's policies and published reports (2). Further, the WHO claims that good mental health is not only essential for an individual's well-being, but is also a necessity for a country's economy to grow, and for their ability to reduce poverty (1). According to the WHO, almost 75% of the global burden of neuropsychiatric disorders is found in countries with low and lower middle incomes (1). Despite the fact that more than 80 % of the world's population live in these countries, very little of the published mental health research is derived from these places (3). Even though mental ill-health does not necessarily contribute directly to the world's mortality rate, mental health is important for the quality of life and well-being. Recognition of this could contribute to a more even balance of the research on mental health (4).

In terms of mental health it has been recognized that calculations of disability-adjusted-life-years (DALYs) is a more adequate measurement of the impact on individuals' life rather than mortality. DALYs are the sum of years of life lost to premature mortality and the years of productive life lost to disability. The DALYs can then be used as a measurement of the gap between the actual health situation and the "ideal" health situation. This ideal situation would be if the total population could live a long life without disease and disability (5). The report "Global Burden of Disease", published in 2006, reported that neuropsychiatric conditions account for roughly 25% of DALYs (6). Of the conditions, there are mental disorders such as affective disorders, substance- and alcohol-use disorders, as well as schizophrenia and dementia, which account for most of the contribution to the DALYs (6).

The field of mental health is still given a low priority in many parts of the world, with developing countries tending to prioritize infectious diseases and reproductive health, while developed countries have turned their attention to non-communicable diseases that shorten peoples' lives by a number of years, and do not focus on those conditions that increase a person's years living with a disability (7).

1.1.2. Mental health in the Arab world

In their report on world mental health, the WHO stated that roughly a quarter of the patients seeking care at primary health care facilities in the Eastern Mediterranean Region were there for mental health problems (8).

Researchers have stated that there is an urgent need for increased mental health education of the public, an improvement of psychiatric services and professional training, as well as a thorough development of mental health services, legislation and policy in the Arab world (9).

A geographical analysis published in 2005, aimed at mapping mental health publications in Arab countries from 1987 to 2002, identified 338 studies concerning mental health, with a majority of those studies originating from Saudi Arabia, Egypt and Kuwait. However, just 25 % of Arabic medical journals, out of a total of 280, are indexed in PubMed, hence the study may have underestimated the amount of research conducted in these countries (10).

According to Al-Krenawi et al. (11), the body of research published about various ethnic groups, Arabs in particular, is not comparable to the size of the population when compared with the amount of published material from other ethnic groups in other parts of the world (11).

Arab society is highly diverse in terms of ethnicity, language, tribes, socio-economic and national identities. Several Arab societies have been more affected by the influence from western countries than others, and Arab countries can be said to be trying to balance these western-inspired norms with existing tribal- and family structures (11). Because of this, and for reasons discussed below, Al-Krenawi et al. suggests that several ethno-sensitive approaches are needed when working with mental health, either clinically or for research purposes. He also suggests that the degree of family support and religious affiliation may have an impact on how different people will view the different approaches of mental health professionals (11). Mental health literature from the Arab world suggests that Arab patients have a tendency to somatize mental distress, and explain it using physical terminology to avoid the stigma that can be attached to suffering from mental distress. Some patients also avoid visiting a health service at all, and would rather seek help from a traditional healer or a general practitioner (9;12-15). Such somatization can make it difficult for health personnel to distinguish between physical and mental distress, hence the elaboration of patients' culture and beliefs will guide the practitioner both to understand the symptoms presented, and whether the treatment suggested is in harmony with the patient's beliefs (11;12;16). Somatization can further lead to an expectation about short and non-demanding treatment, which can contribute to a greater risk of discontinuation of treatment (11;12) Somatization

has been thought to be restricted to specific ethnocultural groups, but researchers have found this phenomenon to be prevalent and common in every studied cultural group (17).

Religion is very important to many Arabs, therefore religious and/or supernatural explanations for mental distress should not be surprising for health workers (11;14;18). A patient's explanations and thoughts about the origin of mental distress will most likely affect their expectations of the treatment, and these expectations may not always be in line with those of the health worker (11). Health workers should attempt to bridge this gap between the mind-set of the patients and themselves and, rather, incorporate the patient's expectations rather than keeping them strictly separated (11). The patients themselves often develop a way to use both modern and traditional health care systems, either at the same time for the same symptoms, or in succession if some parts of the illness remain untreated after using one of the services (19-21).

1.2. Sudan

1.2.1. Country background

Sudan is the largest country on the African continent and is located in the north-eastern part. The country is amazingly diverse in terms of both climate and culture. While the northern part is mostly desert, the further south one moves, the more tropical the climate becomes, with the capital city, Khartoum, residing at the confluence of the Blue and the White Nile in a dry savannah area in the middle of the country. This large country is the home of an estimated 45 million people from several hundred ethnic groups, who speak more than 100 different languages (22) with as many as 20 % of the population living in and close to the capital city (23).



In addition to the Nile Rivers, Sudan have natural resources in the form of oil. This oil has only recently been accessed, as previously resources had been focused on the long conflict and war between the north and south. This war forced millions of Sudanese to flee to surrounding countries or within Sudan, until it came to an end in 2005 with signing of the Comprehensive Peace Agreement (CPA). The oil production has made Sudan one of the largest oil producer on the continent (24).

In spite of the discovery and the production of oil, Sudan is classified as a low-income country with a GDP per capita of USD 2 051 (25). The poverty rate is estimated at 50% (26). 42% of the population is below the age of 15, and annual population growth is measured at 2.5%. Number of years spent in school is expected to be 4 years, and the literacy rate is 61% with higher rate among males than females (71% and 50%) (22). In terms of traditional livelihoods, the Sudanese live from farming, cattle nomadism and fishing, while in the bigger cities more untraditional work such as office jobs, education and construction work are becoming more wide-spread (27). Life expectancy at birth is 58.9 years and the infant mortality rate has been estimated to be 68 per 1000 live births, while the maternal mortality ratio is 450 per 100 000 live births (25).

The majority of the population still live in rural areas, but urbanization is ongoing due to work migration; natural disasters, such as flood or drought; and conflict. These phenomena have led to a rapid growth in the population of Khartoum, which now has an estimated population of more than 5 million people (22). Sudan has a total of 4.9 million internally displaced

persons (IDPs), which includes 2.7 million in Darfur, 1.7 million in Khartoum, 390 000 in Southern Sudan, and 60 000 in Southern Kordofan (25).

Earlier this year, one of the requirements of the CPA was fulfilled with a referendum on whether Sudan should remain one country or become two separate states. Voting was in favor of separation, which means that the status of many migrants from the south, having stayed in Khartoum for many years, is being turned around. It is not certain what the status of these migrants will be, if they will be forced to move back to the south, or if they can become legal residents in the north. In fear of the first alternative, many have been leaving their homes in the north to return to the south in the months surrounding the referendum. If everything goes as planned, Sudan will divide into two countries during the months to come, and no longer be the biggest country on the African continent.

1.2.2. Culture and migration

Sudan is the home of around 40 million people, and can be roughly divided into two major heterogeneous cultures, namely the Arabs and the Africans, which again can be divided into nearly 500 ethnic and tribal divisions. The northern part of Sudan, with the exception of larger towns and cities, is mostly inhabited by Arab-speaking Muslims. Many different mother tongues are spoken in addition to Arabic, and the different ethnic groups live different types of lives, from settled to nomadic and fishermen to camel-raising, to mention a few. In the south Christianity is widespread, along with animist and traditional beliefs. As in the north, the people from the south speak several different languages, and the tribes are important methods of identification and belonging. The African-Sudanese constitutes an estimated 52% of the total Sudanese population, with the remaining population being made up of Beja and foreigners. The Sudanese culture is extremely diverse; each ethnic group and inhabitants in a region have their own cultural expression and language (22).

Due to problems such as natural disasters, war and lack of sustainable work, people from all over Sudan have been migrating towards the capital. From the south, many thousands fled to the northern part of the country and Khartoum to escape the war that tore Sudan apart for several decades. Even though the CPA put a stop to the fighting, many of these migrants stayed in the city they now call home. The armed conflicts and drought in the West forced many to migrate towards Khartoum, and migrants have also been coming from the north and east. The migrants have been settling in the outskirts of the capital, and have been recognized as IDPs. While this status has been changed for many to semi-settlers, their living conditions have not changed much. In these areas, migrants from all over Sudan live

together, and some acculturation over the years must be expected, even if tribal clustering is common (28).

1.2.3. Health policies

In Sudan, health has been declared the first national priority, only behind security (29). Numbers from the WHO show that the Ministry of Health expenditure was 3.8% of the country's budget, however the expenditure on mental health is unknown (23). The current health policies prioritize mother and child health, as well as epidemic diseases with outbreak control, and malnutrition. The health care system is based on primary health care, with 2031 clinics, whose goal is to work as a decentralized health care system, and work as the first point of contact at the village level. In small towns one can reach secondary health care facilities, while tertiary health care services consist of provincial, regional, university and specialist hospitals. 72 hospital beds and 19 physicians have been recognized per 100 000 people (23). 0.2 beds per 10 000 people are available for psychiatric patients, 0.09 psychiatrists and 0.17 psychologists per 100 000 of the population. While there is a shortage of trained health personnel, there is no cooperation between the different institutions where health workers receive their training, and the Ministry of Health. This makes it very difficult to meet personnel needs and, hence, NGOs have been recognized as a major partner in health care, but unfortunately not in mental health care (29).

The national health policy restates global strategies for health, such as the Alma-Ata Declaration and the Millennium Summit Declaration. After the signing of the CPA, the national health policy has placed a focus on vulnerable groups, such as migrants, elderly, refugees, displaced persons and street children, and to actively make use of the economic growth in the country to help these vulnerable groups to become socially and economically productive (30). Hence, health "will be used to enhance peace building and rehabilitation and to encourage economic development" (30, pp 5).

The mental health unit at the FMoH was established in 1990. This unit, as well as the Minister of Health receives advice and support from the mental health board (29). Sudan's mental health policy has been newly reformulated, with the last version of the legislation dating back to 1998. Most of the population has free access to essential psychotropic medicines, but this is only in psychiatric emergencies. However, the cost for these medications in non-emergency situations is manageable for those with a regular income (23).

Mental health facilities in the country are mainly concerned with inpatient treatment of adults. For patients who have been discharged from the hospital, there is no follow-up care in the community, and no out-reach services. Some attempts to integrate mental health care with

general care have been made, with positive evaluations in terms of awareness about mental health in the public, and the training of primary health care workers. However, this approach has not yet been implemented as a standard. The distribution of mental health facilities favors the areas around Khartoum, and clearly does not reach the whole population (23).

1.3. Study site

Mayo is an IDP camp in the outskirts of Khartoum, where several thousand migrants from all over Sudan live. The area is said to house between 100 000 and 200 000 people, but no public estimations have been identified. Mayo has been defined as a squatter settlement, which is a settlement built on illegally occupied land by the newcomers. The housing consists of temporary shelters built from cardboard, tin, sacks and mud. Living conditions in these types of slums are said to be far worse than other types of slums. Roughly half of the houses in Mayo have access to free water; the remaining buys it. The same amount of people have latrines in their homes, and few have electricity. Near the settlements there is a hospital, and there are markets within the settlement and just outside (28).

Mayo is divided into blocks. Each block has their own community leaders, known as the community committee. Residents in Mayo can seek guidance and help from this committee in every matter conceivable. The current study was conducted in Mayo, Block II.

1.3.1. Sudan Mental Health Project

The identified literature in the field of mental health in Sudan is, as discussed earlier, limited. Hence, the aim of the Sudan Mental Health Project (SMHP) is to study mental health problems, disability and health-related behavior in two IDP areas in Khartoum and Gazera States in Sudan. This is a longitudinal community-based study obtaining data at baseline and after one year. It contains an intervention in the form of a strengthening program of the health system by training the primary health care personnel between the two measurements. The hypothesis was formulated as: “the prevalence of mental health disorders among internally displaced persons in the area will be high, given that the general health and welfare of the population in the area has been negatively affected on a continuing basis by the civil war and war-related displacements”.

The SMHP is implemented in two IDP areas in central Sudan: one in an urban area (Khartoum) and one in a rural area (Gazera). The population of these IDP areas settled there after migration for several different reasons, such as flood, drought or conflict, over a period of time. Due to the relative stability and accessibility, cities in the Central State were chosen as the study cite. The study areas were randomly drawn out of a sample of possible IDP

areas in the Central State. The idea was initially to use stratified randomization, which proved difficult due to the lack of a systematic numbering of the houses in the different areas. The FMoH therefore provided a list of IDP areas around Khartoum and Medani (Gazera), the largest cities in Central Sudan, from where it was drawn the two areas to conduct the research; Mayo (Khartoum) and Mobi (Medani).

Recruitment of participants was done in four geographically oriented directions, starting from the health center, and continuing to all houses in all four directions. For households who agreed to participate every individual above the age of 18 who had given informed consent were asked to participate.

In the baseline of the SMHP an incentive was given in the form of sugar; sugar is a valuable item in the Sudanese kitchen, but the price can be too high for some. In the follow-up no incentives were offered.

The intervention that was carried out consisted of training the health workers, focusing on developing knowledge, skills and attitudes in order to improve their performance when handling mental health problems. This training included the use of psychotropic medication, supportive counseling, community-based rehabilitation and self-help activities. Further, the training focused on psychological first aid, recognition and treatment of common mental disorders, severe mental disorders, child psychiatric problems and substance use disorders. The WHO mental health guidance package and the training program for doctors and medical assistants developed by the Sudanese FMoH were used as resource material. The training lasted for four weeks and was assisted by the local research team. This team consisted of two psychiatrists, one psychologist, a community physician from the University of Khartoum, the head of the Mental Health Division and the director of non-communicable disease from the FMoH in Sudan. Ten health workers were trained in Medani; none in Khartoum.

The Sudan Mental Health Project is a joint project between the Division of Mental Health and Addiction, Oslo University Hospital and the Institute for Clinical Medicine, University of Oslo as the Norwegian stakeholders. The Sudanese partners are University of Khartoum and the Federal Ministry of Health.

Chapter 2 – Literature review

2.1. Mental health in Sudan

The literature on mental health in Sudan has long been scarce, but during the past years it has become more comprehensive (31). A large proportion of the studies on the Sudanese population have focused on refugees living in areas outside Sudan, with such examples as Paardekooper et al. (32), Neuner et al. (33) and Coker (34). These studies have focused mainly on the levels of trauma and the psychological and psychiatric impact of these. However, Cederblad published several articles on young Sudanese Arabs' mental health from villages near Khartoum. This study revealed that 14 % of the sample had moderate to severe psychiatric symptoms, while 21 % were diagnosed with mild symptoms. The study revealed that subjects with higher education levels had a lower frequency of mental distress, and that participants without employment more often showed psychiatric symptoms (35;36).

Prevalence studies with populations in Southern Sudan have revealed that the Sudanese population has an elevated prevalence of psychiatric symptoms, such as post-traumatic stress syndrome (PTSD). This suggests that there is a need to consider the mental health state of refugees and people moving from potentially traumatizing events such as hunger, floods and war (37;38).

Some of the coping strategies and aids among the populations that have been identified are religion, social support networks, reframing and a focus on the future (39;40). Traditional healers (THs) are one of the main health providers in Sudan, however, no regulation of the service these healers provide has been implemented. As such, cases of abuse have been reported (41). Since mental health services are not available at the primary health care level in the country, this can contribute to why traditional healers are so often used for mental distress (41). Even though no regulations exist, many traditional healers and professional health workers perform mutual referral, with either subsequent or parallel treatment (41).

Cultural factors can, as mentioned in the previous section, influence the many aspects of mental distress. These aspects can be summarized into conception and manifestation of the illness, diagnosis, subjective experience and the prognosis, family and community responses and help seeking patterns and behavior (42). For the Sudanese, both religion and social support have been found as critical factors for coping when it comes to mental distress, factors that have also been found in other cultures in developing countries (31).

In Sudan, THs have been found to be the most common method for the treatment of mental illness. Some possible reasons for this that have been suggested are the payment required for THs is lower than for medical services, and the fact that medical services in Sudan are restricted to the densely populated areas (41).

2.2. Cultural psychiatry

Littlewood (1990) argued that cross-cultural psychiatry has been divided into two traditions, namely the etic versus the emic approach. The etic approach claims that psychiatry and mental illness are universal, hence, diagnosis and treatment can be implemented in any culture. On the other hand, the emic approach advocates the need for understanding mental illness as generated from within cultures (43). A focus on these understandings of mental illness can help elicit local cultural, emic, perspectives of the illness, a view that is recognized and appreciated in the field of transcultural psychiatry (44;45).

There is an ongoing debate on how cultural beliefs and explanations affect mental health, both in manifestation and beliefs about treatment. It is important with an awareness among health professionals about how to elicit these causal explanations and the importance of them (15;46). The importance of these differing health beliefs has been recognized by the American Psychiatric Association (APA), which added a guide on Cultural Formulation to the latest edition of the Diagnostic and Statistical Manual of mental disorders (DSM-IV) (47). This guide can be viewed as a response to the criticisms raised by cross-cultural researchers and medical anthropologists, who claim that the DSM has not been culturally sensitive enough (2). Cultural sensitivity is regarded as important in recognizing psychiatric distress in all cultural settings, not just those settings where the DSM was developed and implemented. The formulation in the DSM-IV draws attention to the psychosocial environment surrounding the patient, with the goal to assist the schedule in different cultural settings, and hereby address the need for culturally sensitive psychiatry. Cultural factors, together with biological, psychological and behavioral factors, have been recognized as being important in shaping pathological behavior (48). Within cultural factors, the most important aspects are EMs (45).

2.3. Explanatory models

Explanatory models (EMs) can be seen as individual variations in how an illness is recognized and explained, and stem from socio-cultural determinants, as well as from critiques proposed by ethnographers and anthropologists regarding psychiatric practices in various cultures (49). EMs can be understood as causal explanations of illness, influenced by culture and norms where the individual reside. Different ethnic or social groups may inhabit their own explanations for various symptoms, which can include causes, severity, prognosis

and treatment of illness (50). Kleinman's framework of EMs emerged from his work in China and Taiwan and recognized the differences between these cultures and the Western cultures with regards to thoughts and concepts about the causality of mental illness. This work also led Kleinman to see that these beliefs about causality were seldom similar between lay people and professional health workers. From this, Kleinman claimed that if health workers are to be efficient and to provide good care, a patient's EMs need to be known to the health worker (51). This becomes especially important if the health worker and the patient come from different cultural or social background (52).

The term illness, rather than disease, is here used to cover the experiences of sickness, more than just the abnormalities in the body (51).

EMs can contribute to decisions about help-seeking and choice of treatment, the ability to cope, the use of social support and the quality of life (53-55). EMs can vary from individual to individual, within an individual and between groups of individuals (56). The same person can hold different EMs at the same time, with some of these being intuitively incompatible (49). An example of this is a person who describes the causes of schizophrenia as both religious and biological or who use scientific work to explain the illness (57). This may lead to the potential problem of patients subscribing to certain EMs while the health provider relies on their own EMs, often partially trained and partially acquired (2). Several studies have also reported that in the presentation, assessment and management of mental illness, general practitioners reveal different cultural views and assessments (52;58;59). Also, patients have been found to be more satisfied with their treatment when the clinician and the patient share an EM (60). Thus, exploring the variations in EMs may be helpful in understanding help-seeking, service utilization and treatment outcomes as well as developing culturally appropriate psychotherapy (46;61).

EMs are not exclusively important to mental health. Researchers have also studied the impact of EMs on the recognition and evaluation of symptoms regarding different types of mental distress and physical disease (49;62).

Several different frameworks have been presented on how to classify different illness beliefs. In addition to the theory of EMs, the theory of illness representations (IR) is known to address illness perception. The rationale behind IR is rooted in psychology and the behavioral response to physical threats people display. This rationale leads to the argument that every individual has both a cognitive and an emotional representation of their illness, and the appraisal and re-appraisal of the responses to these representations will trigger a

change to their IR. As with EMs, IRs influence and are influenced by the cause of illness, the timeline in terms of treatment and cure, and the consequences of the illness (63).

Anthropological studies across cultures have shown that various psychological phenomena are interpreted differently among individuals, incorporating influences from their different cultures (56). Most societies have formed a collective explanatory model that many of its inhabitants refer to, but every individual often has their own interpretations and ways of explaining mental distress (56). These models or causal beliefs can influence how and if people will seek help, from whom they will seek help and whether traditional or professional medicine will be seen as adequate or preferable (45), all of which are recognized as important concerns in psychiatry (57).

Different instruments, methods and frameworks have been used to try to capture the reasons why people do or do not seek help for mental distress, from whom this help is sought, and to elaborate upon people's EMs regarding mental health and ill health. Foster (64) introduced the idea of personalistic causes versus naturalistic causes of illness. In the personalistic category, one finds causal beliefs about religious or magical reasons for an illness. Conversely, the naturalistic causal beliefs about an illness revolve around situations or forces that are beyond the influence of the person (64). In the line of Foster's thinking, Young's (65) dichotomy between internalizing and externalizing medical beliefs was presented in an attempt to clarify different EMs. Physiological processes were defined as internalizing, while situations and events outside of the body were classified as externalizing (65). Data from more than 1300 cultures has been arranged in a system where the categories natural and supernatural are super ordinate (66).

Research has shown that treatment satisfaction is related to a tendency to rely on biomedical explanations of illness (67). Even though these researchers did not find culture to be a significant predictor of attitudes toward help-seeking, EMs were (67). This can have implications for the need to provide culturally sensitive services to reach better treatment satisfaction regardless of whether the causal beliefs of illness fall into the same category as the care provider or not (68).

From a social and cognitive psychology standpoint, various theories can be drawn upon to understand what can guide help-seeking behavior, illness outcomes, illness experience and explanations and actions related to health promotion. The health belief model states that a person's attitude towards performing an action combined with their subjective norm relating to the action makes up the intention for performing that action (69). The cause that a person attributes their illness to can be of importance for the action that he or she may choose to

take (70), and the locus of control can have an impact on whom a person turns to for help, or if help is sought at all (71). Seligman's theory of learned helplessness raises the question of how, and if, a person will deal with an illness (72). In addition, it can be argued that Bandura's theory of self-efficacy, where earlier experience, belief about the chances of succeeding and learning by observing others can influence a person's choice on whether, or where, to seek help (73). People's actions can, on this basis, be founded in the perception of cause, how they attribute the cause, the actions they choose and do not choose to take, the expectations tied to the responses from these actions and also how the person perceives the quality of the health worker's action (46).

2.4. Factors influencing explanatory models.

EMs are often divided into western or non-western beliefs, where the distinction between the two lies primarily within the beliefs in supernatural causes of illness. In addition, some physiological explanations that are not found to be common in Western medical language are viewed as non-Western EMs. An example of such physiological EMs can be that the body is out of balance, or the person is taking in food that is wrong for them (53).

Diagnosing mental distress correctly and starting the corresponding treatment is important in the facilitation of well-being and quality of life (53;54). However, it is important that the diagnosis is viewed within the cultural context of the patient, so that the clinician can interact with the patient in a coherent fashion (74). By assessing the EMs of the patient, the clinician might be more able to treat the patient.

2.4.1. Socio-demographic factors

A study comparing Pakistanis, British-Asians and British in the UK found that younger participants more often reported believing in both natural and supernatural causes of mental distress. A significant predictor for non-Western EMs was religion, where Muslims had stronger beliefs in these EMs than Hindus, Sikhs, Christians and those with no religious affiliation. However, culture was not found to be a significant predictor for positive attitudes towards seeking professional help (75), which is the opposite of the finding that subscription to a supernatural EM is related to the choice of a religious or traditional healer (76).

2.4.2. Cultural factors

Several of the studies focusing on explanatory models (EMs) have been qualitative studies, primarily interested in elaborating on the EMs regarding depression or schizophrenia (77-79). In a quantitative study conducted in Ghana, Fosu hypothesized that women who had prior contact with health facilities would be more likely to seek help for mental distress, while

women with a supernatural EM would be the least likely group to seek help (55). The results showed that women with a supernatural EM were significantly less likely to seek help from a mental institution; the odds for not using such a facility were four times higher for women with supernatural EMs than for those who believed in natural causes of mental distress (55). Another significant finding was that women with no formal education were less likely to seek help than those women with some education (55).

A comparison between five groups of Asian immigrants in northern America showed that the groups differed significantly in EMs depending on their place of origin (45). The model the participants subscribed to was found to have an impact on the attitude towards seeking help from a health worker. A Western model correlated positively with a positive attitude, while the opposite trend was found for the participants subscribing to a supernatural beliefs model (45). However, the factor with the most significant impact on attitude towards seeking help was the perceived access of culturally sensitive services (45).

Interviews with patients regarding beliefs about illness causation revealed that from groups consisting of African Caribbean, Bangladeshi, West African and white British in the United Kingdom, the white British group cited biological causes of illness more frequently than the other three groups. The African Caribbean, Bangladeshi and West African groups cited supernatural causes more often. Thus, subscription to a supernatural EM was found to be a determinant for treatment consisting of a religious nature or no treatment at all (67). This is to some extent supported by the finding that, in the UK, Bangladeshis gave physical and spiritual explanations for mental distress more often than black Caribbean and British participants (49). On the other hand, individuals who reported they were relying on a biological and social EM more often preferred medication and counseling for their problems. Hence, the group reporting a biological EM was more satisfied with the treatment they received, and also had better therapeutic relationships (67). This finding is supported by Callan et al.'s findings that treatment satisfaction was higher when a patient's and a psychiatrist's EMs were similar (60).

2.4.3. Education and accessibility of service

In Uganda, Johnson found that lay individuals agreed with professional health workers in some aspects of EMs, but disagreed in some key areas. These differences were found in the name, impact of the condition, source of help needed and what type of treatment one needed (79). The lay participants agreed with professional mental health workers in some aspects of EM, and with traditional healers on other aspects. The lay persons agreed with professional health workers on the causes of depression; however, in terms of the impact of the illness,

the lay persons agreed more with traditional healers' EMs (79). However, among health workers and female patients both the terminology and manifestations of the illnesses differed. For example, health practitioners used the terms "stress" and "depression" for the conditions, while for the women the most used term was "problems of the mind". While stress and depression were seen as ill health from the practitioner's point of view, the women did not regard their problems as ill health until physical symptoms emerged (2). However, for this study, the EMs discussed were not so different between the health workers and the lay participants as the authors hypothesized (2). On the other hand, in studying the EMs of the inhabitants and professional health workers in Bombay, Weiss could not find a clear dichotomy of the terminology (46).

Regardless of the participants' ethnic backgrounds, it has been found that participants with a diagnosed mental disorder were more likely to subscribe to a spiritual cause for their distress (49).

In a study conducted in Uganda, Patel interviewed participants regarding EMs for mental distress. The researcher found that depending on the perceived cause of the illness, the participants would choose either a traditional healer or biomedical sources of treatment. However, the participants revealed that they would rather consult both the traditional healer and biomedical services to resolve different issues within the same illness episode (80). The EMs elicited by the participant were often spiritual in origin, however, the biomedical model was also recognized and mentioned by several (80).

Another study reporting on illness beliefs and attitudes towards modern mental health services was conducted in Kenya as a revision of the health policy of the country. Participants were asked which service they would turn to for help if having convulsions, strange behavior, excitement, possession or for physical symptoms. The frequency of turning to a modern mental health service was found to be descending for the four first categories, while more than 94% answered that they would seek modern health care if they had physical symptoms. However, when asked what the participants expected the government health service to provide, it was revealed that most only expected medical care. Other treatments could be found, and were preferred to be found, elsewhere (81).

Even though research on EMs has gained a lot of attention and has contributed to both researchers' and health workers' awareness about culture's influence on how illnesses can be explained and manifested, the limitations regarding EMs have been pointed out. EMs are beliefs which are subject to change and adaptation by different events. Thus, people can

hold diverse and contradictory EMs at the same time, and these can also change across time and circumstances (56;82).

2.5. EMs of Sudanese populations

Refugees and displaced persons with origins in different parts of Sudan, mostly from the south, have for some years been the subject to various mental health studies. Mainly, these studies have focused on coping strategies and experience with potentially traumatic events (34;39;40). However, one study found that southern Sudanese presented with physical symptoms that had their origins in food, overwork, worry and stress (34). An earlier study conducted with Arab women in Sudan found that beliefs about possession were wide spread in the population studied, and that the spirits were believed to live in a parallel world (83).

2.6. Ways of examining explanatory models

SEMI: The Short Explanatory Model Inventory is a qualitative method of elaborating upon patients' EMs within a structured framework, which can enable additional quantification of the data, based on Kleinman's framework. The interview is divided into five sections; personal background, nature of presented problem, help-seeking behavior, interaction with healer and beliefs related to mental illness. The SEMI was developed as a tool that could be used both in clinical practice and in research on a clinical population (44).

BEMI: The Bart Explanatory Model Inventory was developed by a researcher who identified a gap in culturally varied beliefs assessed by other instruments. It is a mixed methods instrument aimed at helping clinicians understand and assess patients explanatory models (84).

EMIC: The Explanatory Model Interview Catalogue is a semi-structured interview which was created in an attempt to integrate frameworks from clinical, epidemiological and social science work. It was originally developed to study leprosy, and the cultural meanings, emotional impact and compliance with treatment around the illness. It is based on the framework presented by Kleinman. The EMIC, similar to the SEMI, is developed for use with a clinical population (85).

CMQS: The Causal Models Questionnaire for Schizophrenia was developed in China and was aimed at exploring patients' and their family members' causal explanations for their illness (86). The instrument is divided into four parts. The first asks the patient open-ended questions about causal beliefs regarding their schizophrenia. The second part consists of listing up 45 causes, which the respondent rates as probable causes for the illness. The last

two parts ask the respondents to rank the causes according to when they first heard of the possible cause and who endorsed this cause (86).

MDEMQ: From his experience with Cambodian patients, Eisenbruch developed the Cambodian Explanatory Model Schedule (CEMS), specifically aimed to explore the illness beliefs among South-East Asians (15;45). Thus, the MDEMQ is expanded from the CEMS to make it possible to implement for people from various cultures and background (53).

Eisenbruch and Handelman developed the CEMS on the basis of Murdock et al.'s framework, the World Ethnographic Atlas (15;66). This framework consists of a classification of theories of the causes of illness, divided into natural and supernatural categories. The natural category consists of infection, stress, organic deterioration, accident and overt aggression. The supernatural category, on the other hand, consists of mystical, animistic and magical causes of illness (15;66). The researchers added some aspects of illness causations derived from Cambodian participants, including humoral problems and vital organ disruption. From this background, a 26-item questionnaire was developed and pre-tested. Findings suggested that the categories put forward by Murdock et al. could not cover every aspect of illness causation presented by the Cambodian sample. Thus, Eisenbruch developed a questionnaire to cover several more aspects of the theories about mental illness causation, drawing on frameworks presented by Murdock et al. (66), Foster (64), Young (65).

Qualitative methods: Different qualitative methods are useful in obtaining in-depth knowledge and to elaborate upon the realities of the participants, and the meanings given to these realities, both in clinical and non-clinical populations. Open questions can more easily elicit thoughts about EMs not targeted by questionnaires.

2.7. Rationale for study

Different people understand and explain their mental distress differently. The ways these explanations are formed have been shown to be related to distinctive cultural health beliefs. These cultural beliefs are thought, and found, to influence how people present the disorders and their causal attribution, as well as determine a pattern of help-seeking. The research presented in the literature review suggests that the ways people explain mental illness are many and diverse, and also play a role in how clinicians may or may not understand the patient's view. Culture, gender and age, as well as other social factors, have been found to influence EMs, and hence the evaluation of the value of different treatments and care providers. Without an understanding of EMs and the possibility of a wider range of EMs, clinicians and other health providers risk missing the magnitude of the symptoms presented to them, or disregarding a patient's explanation and attribution about their illness. The

population in Mayo is under-served in regard to mental health services. There is a lack of knowledge about how they relate to mental illness. The Sudan Mental Health Project is focusing on the mental health status and needs of the population in the area, while this study attempts to address the gap of knowledge about EMs held by the same population.

2.8. Conceptual Framework and Objectives

2.8.1. Conceptual framework

The framework of EMs has been chosen for this study due to the attention given to cultural differences and sensitivity, despite the fact that the concept was developed in a clinical setting (46). It is also the most common framework used to elicit thoughts and opinions about the different causes, duration, treatment and impact of illnesses. Other frameworks, such as those discussed previously, focus more on structural factors regarding illness and disease, while EMs focus on the cognitive processes and orientations (2). The questionnaire chosen for this study, the MDEMQ, has its basis in the work on EMs by Kleinman, and was chosen over other questionnaires and interview guides due to its development from a non-clinical population (53).

2.8.2. Objectives

The main objective of the study was to explore the EMs within a non-clinical sample of residents in a poor, semi-urban and multi-cultural setting outside Khartoum, Sudan.

2.8.3. Study Questions

1. Which EM is more common in this sample?
2. Which category of EMs is more common in this sample?
3. What are the main demographic factors associated with specific EMs?
4. Which service is ranked as first choice for mental distress?
5. Is the service of choice and EM associated?
6. Is perceived accessibility of different health services and service of choice associated with EMs?

Chapter 3 - Methodology

The study was conducted as part of the second wave of the Sudan Mental Health Project (SMHP), refer to section 1.3.1. for an elaboration of this project. Funding for this project was ensured through the SMHP, which is funded by the University of Oslo and Oslo University Hospital. Socio-demographic information was collected, with the variables in the socio-demographic questionnaire used previously by the SMHP. Data analysis was performed to answer the formulated research questions; Predictive Analytic SoftWare (PASW) Version 18.0 was used for all statistical analyses.

3.1. Study Design and sampling

This study is an exploratory and descriptive cross-sectional study of internally displaced persons (IDPs) who participated in the baseline study of the Sudan Mental Health Project (SMHP). Participants were asked to take part in the follow up in the SMHP, where the Mental Distress Explanatory Model Questionnaire (MDMQ) and the accessibility questions were added to the original questionnaires.

Prior to data collection the community leaders in Block 2, Mayo, were contacted to ask for permission to conduct the study in their area. Local guides were provided to help the data collectors find the allocated households. Here, in terms of Sudanese ways of living, a household was defined as people sleeping and eating under the same roof.

3.1.1. Sampling

Data collection took place during late September and October 2010 in the IDP area; Mayo, in Khartoum, Sudan. The study was approved through the Sudan Mental Health Project, which was approved by the Regional Committee for Medical Research Ethics and the Norwegian Data Inspectorate. The SMHP obtained ethical clearance in Sudan through the University of Khartoum and the Federal Ministry of Health, Sudan.

The data collectors and their respective guide went from door-to-door where they had conducted interviews earlier, to ask whether individuals wanted to participate in the follow-up study. In this study, no one chose to use their right to refuse participation. During data collection, the data collectors began by explaining the research, why they were conducting another round of interviews, and asking for informed consent. Verbal informed consent was chosen due to the widespread illiteracy among the population in the area of the study.

For the purpose of this study, a simple sample size calculation was used; the sample size was calculated to 384 participants. Given that the SMHP experienced few drop-outs in their baseline, it was expected that there would be few additional drop outs in this study, thus the aim was 400 participants to achieve an adequate statistical power of 85%.

Inclusion criteria: all subjects living in the area of research above the age of 18 willing to participate who had participated in the baseline study of the SMHP. The exclusion criteria were a wish to not participate again, being under the age of 18 and not a resident in Mayo.

No incentives were given.

3.2. Research tools

A socio-demographic questionnaire, developed by the research team in the SMHP, consisting of questions about age, sex, area of origin in Sudan, education, marital status, family size, employment and income, in addition to the MDEMQ and the accessibility questions was used.

3.2.1. Accessibility

The accessibility questions were aimed at assessing which health service is preferable for the participants in terms of expenses and whether the service in question is perceived as affordable or not. Accessibility was measured by the following: distance to the service, whether the respondents had the time necessary to go to that service, whether the participants perceive that the health providers understand the potential illness, whether treatment is available, if the health professionals provide emotional support in a preferred fashion and whether the treatment is seen as adequate. The last question in this part of the questionnaire (“which of the above services would be your first choice, if having a mental illness?”) was to be answered regardless of the pattern of answers in the former questions. These questions were derived from a study in Ghana conducted by Fosu (55) which explored the EMs of women. Findings from this study are discussed in the literature review section.

3.2.2. The Mental Distress Explanatory Model Questionnaire

The MDEMQ is a 45-item questionnaire that explores how non-clinical research participants from different cultures explain mental distress. As the questionnaire was developed for use in various populations, the different items will most likely vary in relevancy for every participant. Still, every item was included as an attempt to meet as many explanatory models as possible (53). The questionnaire is introduced through a paragraph where symptoms on mental distress are exemplified, and mental distress is described as a continuum. The paragraph asks the respondent “to think about any sort of mental illness; to think how *any* person,

including the respondent, might suffer mental distress; and to imagine what he/she or anybody might regard as the causes” (53, pp 4). The 45 items included in the MDEMQ are formulated as statements about how mental distress can be caused, and the respondents are asked to rate the likelihood of the statement for leading to mental distress on a 5-point Likert scale ranging from “not at all likely” to “highly likely”.

Eisenbruch conducted a multidimensional scaling analysis and discovered that the items in the questionnaire clustered into four explanatory categories; Western Physiology (WP), Non-Western Physiology (NWP), Supernatural (SN) and Stress. Stress and WP are considered western EMs, while NWP and SN are considered non-western EMs. 13 items were developed in the Stress category and 13 in a natural category, which was further divided into Western Physiology and Non-Western Physiology, with the remaining items making the Supernatural category. The items in the Physiology-categories concern possible physical causes of mental distress.

3.3. Translation, training and pilot

3.3.1. Translation

The questionnaire was originally in English, thus there was a need to translate it into Arabic. An independent, bilingual Sudanese person translated the original questionnaire word-for-word into Arabic. A team consisting of three bilingual psychiatrists worked together on the back-translation, to ensure the retention of the original meanings of the questions in the Arabic version of the MDEMQ. After the back-translation, an independent psychologist compared the two versions of the MDEMQ, to identify potential deviations between the two. Some items (#19, 24, 32, 37) were commented upon as difficult to directly translate into Arabic, and a solution was suggested which kept the meaning of the questions as close to the original as possible, while making sure that the questions were understandable in the Arabic language.

3.3.2. Training

The training for MDEMQ was incorporated in the re-training of the data collectors before the second wave of the SMHP. The first basic training and walk-through of the MDEMQ was done in Arabic, to ensure that the questionnaire items were discussed and trained in the language that the data collection would be performed. However, the discussion and questions afterwards were conducted in English, due to the Principal Investigator’s (PI) lack of knowledge in the Arabic language. Every member on the team understood English, although not everybody was comfortable speaking or discussing in English. Thus, some of

the discussion was mediated by the team-leader to make sure everyone could state their meaning and raise questions, as well as to enable the PI to answer and discuss issues that were raised.

3.3.3. Cultural validation

The items in the questionnaire that raised discussion were related to the accessibility-items. In these cases, it was made sure that the team agreed upon the meaning of every term, to ensure that the data collectors gave exactly the same explanation to the participants when asking these questions. Three questions in the MDEMQ was raised as potentially sensitive; “contact with something or someone taboo” (#11), “contact with something or someone unclean, contagious or polluted” (#16), and “doing the wrong thing when menstruating” (#43). However, the research team members agreed that these items would not necessarily be graded as sensitive to the participants, so they remained in the questionnaire for the pilot. After discussion it was decided that when a participant did not understand a statement in the MDEMQ, the researcher should tick the response “not at all likely”. This was decided due to the fact that if a person has not heard an explanation for a phenomenon, it is safe to assume that this explanation has not occurred to the participant as a likely reason for mental distress.

3.3.4. Pilot

The pilot of the MDEMQ and accessibility was implemented through distributing 40 questionnaires among the 10 members of the data collection team during the first days of data collection for the SMHP. The team was instructed to go through the other questionnaires as normal with the participants, and then spend some extra time on the MDEMQ. The participants were encouraged to ask questions and make comments about any item in the questionnaire. It was decided to perform the pilot as part of the SMHP after advice from the Head of Mental Health Division at the FMoH that the population in Mayo differs from the general population in Khartoum in several ways: places of origin, levels of education, levels of income and life history. It might have been possible to identify people with comparable socio-demographic information, but due to practical feasibility we decided to implement the pilot as it was. It was also concluded, due to the nature of the questions in the MDEMQ, that it would be preferable to conduct the pilot within a population similar to the one the revised questionnaire would be distributed among. Thus, we aimed for comments and queries about the questionnaire from participants that were more likely to inhabit similar EMs and attitudes towards the topics raised in the questions.

At the end of the pilot, replies, queries and input from the participants were discussed. Three participants (7.5%) mentioned question 11 as being sensitive (“contact with something or

someone taboo”), and 5 participants (12.5%) stated that question 45 “made no sense” (“person’s soul leaving the body temporarily or becoming scattered”). After discussing these items thoroughly, together with a psychologist, who is the Head of Mental Health Department in FMOH, and a psychiatrist affiliated with the SMHP, we decided to include them in the revised questionnaire, due to the fact that so few had raised questions about these items. It was noted, however, that the results from these questions needed to be interpreted with care. Thus, no changes were made to the MDEMQ following the pilot. In the accessibility-part of the questionnaire, the categories Christian and Muslim healer were combined into the one category: religious healer.

3.4. Data Collection

Information about socio-demography, previous contact with health facilities or personnel, perceived accessibility of health provider and perceived causes of mental illness were collected.

The data was collected during the last four days of the SMHP data collection. This was done to ensure enough time for the pilot and revising of the questionnaire.

3.5. Data Handling and Analysis

Data was entered into the statistical program PASW version 18 at the end of the data collection period. After completion of the data entry from the accessibility part and the MDEMQ, the entire data set was cross-checked by an outsider to check for typing errors. All errors found were corrected immediately. The data entry of the demographic part of the questionnaire, which was shared with the SMHP, was conducted by personnel in the SMHP and then merged with the data from the MDEMQ.

The finished MDEMQ questionnaires were handed from the data collectors to the PI on a daily basis. The participants were given identification numbers corresponding with a code list, which were kept by the local supervisor of the SMHP together with the socio-demographic part of the questionnaire. The MDEMQ was kept secure in a locked compartment both at the site of field-work (Khartoum) and back in Oslo where the data were analyzed. The parts of the questionnaires handled by the SMHP were stored in a locked compartment at the University of Khartoum. The code list was kept in another part of the University of Khartoum, and has no practical use for the present study. All data, when entered, was protected by passwords.

Cleaning of the data was conducted, any missing values were identified, and excluding of cases pairwise was chosen for analysis. The data set was checked for outliers, with none found to affect the data significantly.

3.5.1. The reliability of the MDEMQ

Pallant states that the most common way of measuring internal consistency is by the use of Chronbach's Alpha (87). The values of this measurement range from 0 to 1, with rising values an indication for greater reliability. Table 3.1 shows the reliability measures of the MDEMQ, and these appear to be satisfactory. However, when checking for the reliability of the subscales the MDEMQ consists of, some "problematic" items. The subscale of "stress" item #33 ("too much work or study") showed negative correlations in the inter-item correlation matrix. According to Pallant (87), to obtain an indication that the items are measuring the same characteristics, all the correlations in this matrix should be positive. Pallant advises to investigate these correlations further only if the Chronbach's Alpha is lower than expected. Also, the correlations in the item-total correlation should be higher than 0.3. Any correlations lower than 0.3 could indicate that the specific item does not measure the same as the scale. One item, infection (#5), showed poor correlation with the subscale Western physiology, with a correlation of 0.218. However, Pallant suggests that if the scale's Chronbach's Alpha is too low overall, the item should be considered for removal. One problem with this is that if an item is removed, the results cannot be compared with other studies using this questionnaire, and for scales that were used earlier, and therefore validated. One would only consider removing "problematic" items if the Chronbach's Alpha is too low (that is, below 0.7). A Chronbach's Alpha higher than 0.8 is preferable, still values above 0.7 are acceptable (87).

When a scale consists of a small number of items, fewer than 10, Pallant suggests that a better solution than the Chronbach's Alpha would be to calculate the mean inter-item correlation for the items of the subscales. Optimal mean inter-item correlation values range from .2 to .4 (87).

Table 3.1. Reliability

Subscale	Number of items	Chronbach's Alpha	Mean inter-item correlation (range)
Stress	13	.867	-.334 (-.041 - .701)
Western Physiology	9	.813	.315 (.071 - .543)
Non-Western Physiology	4	.749	.499 (.238 - .798)
Supernatural	19	.896	.329 (.075 - .821)
Total	45		

3.5.2. Categorization

In Eisenbruch's original article (53), the EM concerning physical illness (#6) is mentioned as an item both in the Stress category and as part of the Western Physiology category. At the same time, Eisenbruch states in the article that the category of Stress should have 13 items, and there should also be 13 in the Natural category, consisting of Western Physiology and Non-Western Physiology. If item 6 was part of the Stress category, this category would include 14 items, while there would only be 12 in Natural. Correlations of item 6 with the remaining items in the Stress and Natural categories were rather inconclusive, with the correlation between "physical illness" and the items in the Stress category ranging from .201 - .491, and the correlation with the items in the Natural category between .231 - .489. On this basis, the item "physical illness" was decided to be included only in the Western Physiology category, so that the instructions in the article were followed as closely as possible. A comparison of this part of the method with the two identified studies that made use of the MDEMQ explicitly was difficult due to the different use of item-numbers. Fung made use of 46 items, while Sheikh only used a 42-item questionnaire (45;75).

Other questions which are associated with more than one category include item 18 (migration) and 1 ("bad experiences in childhood"), which are outliers towards the Supernatural category and item 31 (pace of "modern life"), which is an outlier towards Western Physiology. Both items 5 and 6 ("physical illness" and "infection") are outliers towards Stress, while items 36, 34 and 25 ("chemical imbalance in the brain", "being born this way, e.g., inheriting bad blood" and "bad nerves in the body") are outliers towards the Natural category (53).

3.5.3. Analysis

Statistical analysis was chosen to meet the aims and to address the specific research questions of this study. The first part of the analysis included a univariate analysis to describe the sample. To be able to compare the scores on the items in the MDEMQ, mean sum scores were calculated. T-tests and Mann-Whitney U test, along with a one-way analysis of variance (ANOVA) and the Kruskal-Wallis Test, were performed on dichotomous variables with the mean sum scores from the MDEMQ to assess group differences.

For the analysis, some of the variables were combined. Few participants recorded their original area to be North Sudan ($n = 4$), which led us to integrate these participants with the group from Central Sudan. The variable "education" was combined with "other reasons" due to the small number of replies in both categories ($n = 4$, $n = 8$). With regards to employment, only 7 participants replied they were retired. These participants were therefore pooled

together with those without employment. For “service of choice” the replies weighted heavily on the two services of hospital and private clinics. To be able to conduct a more reasonable comparison between the services, we chose to combine traditional spiritual healer, religious healer and herbalist traditional healer into one category: religious/traditional healer.

When calculating the mean sum scores in each of the MDEMQ categories, each participant with a missing value on an item in the given category was removed for the calculation of the mean. This was done to avoid distortion of the mean by lowering the total score due to a missing value. This gave a total sample size in the analysis of 384.

3.5.4. Outcome variables

The main outcome variable is the EMs presented by the participants, which are measured by the MDEMQ. The replies on these questions fall into one of four categories, which can indicate in what category the participant holds EMs, which may or may not be dependent upon socio-demographic information such as age, gender, education and earlier encounters with health workers from different services. The main outcome variable will be presented in frequencies and percentages to be able to determine which factors contribute more to EMs. The accessibility part of the questionnaire will be analyzed as a potential contributor to the EM displayed, and to the healer of choice.

3.6. Ethical Considerations

3.6.1. Benefits to the participants

The community may benefit from the results of the MDEMQ through the results being made available to the main contributors in the SMHP. Health workers in the community will receive these results and may, through this approach, become more aware of the EMs of the population at hand. Dissemination of the results to the Head of the Mental Health Division at the FMOH in Sudan may lead to their usage for information distribution, indicators of mental health views, psycho-education and mental health campaigns.

Also, the community at large will benefit from participating in the SMHP, as it will increase the number of health workers trained in mental health. This project will also present results of prevalence regarding mental distress, which will hopefully inspire stakeholders and the government to take action where needed. Attempts will be made to continue the supervision of the ongoing use of the primary health care personnel's' skills acquired through the mental health training. An attempt to supply primary health care with essential psycho-tropic medication has not yet been approved, but it is hoped that it will soon.

3.6.2. Risks

Risks for the participants in medical research are often linked to the term “vulnerable groups”. The population in Mayo is a mix of people from all over Sudan, and poverty is a widespread problem in this area. When conducting research with people who are economically and medically disadvantaged, extra care must be taken to ensure that the research is conducted in an ethical manner. The participants for this study were recruited from a non-clinical population, and the MDEMQ asks questions about EMs for mental illness in general. However, the questionnaire touches upon many different possible reasons for mental illness, which may refer to episodes experienced by the participants either before or after migrating to Mayo.

As an appreciation of the potential risk this research might impose on the participants, and as a consequence of the study, the data collectors in the SMHP had the opportunity to refer the participants to psychiatrists with a pre-established cooperation with the SMHP, whenever the participants expressed a need for it, or the data collectors themselves viewed it as necessary. If the data collectors encountered acute situations where participants presented a clear need for immediate help, they could assist using their background as clinical psychologists.

3.6.3. Withdrawal

Participants were allowed both to refuse participation and/or to withdraw from the study at any time they felt necessary without penalty.

3.6.4. Confidentiality

Participants' identities were kept confidential to the fullest extent possible. The participants were given individual household numbers with a corresponding code-list that were kept secure at all times. The finished questionnaires were distributed to the PIs of the two projects (the one in question and the SMHP) and were kept in sight at all times, before being locked in compartments at the end of each day.

Chapter 4 – Results

4.1. Sample description

4.1.1. Demographic characteristics

The demographic characteristics of the study's sample are presented in tables 4.1. and 4.2. The tables show that the sample consisted of approximately the same proportions of male and female participants. The vast majority originated from the western and central parts of Sudan, and most had migrated to Mayo in search of employment or to flee from war. No one reported migration due to drought or flood. Few (11.5%) had attended secondary school or had higher levels of education; while around 1/3 (36.6%) of the sample had never received any formal education. The most common amount of income was reported to be less than 1000 SDG (= 423 USD/2755 NOK) (95%).

Table 4.1. Socio-demographic continuous variables

	Mean (SD)	Minimum	Maximum
Age	36.79 (14.61)	18	85
Years since movement from original area	7.31 (3.60)	1	14
Family size	5.88 (2.90)	2	17

Table 4.2. Socio-demographic categorical variables

	Frequency (%)
Gender (n=399)	
Male	170 (42.6)
Female	229 (57.4)
Area of origin before migration (n=399)	
North	4 (1.0)
South	61 (15.3)
East	26 (6.5)
West	173 (43.4)
Central	135 (33.8)
Reason for movement (n=399)	
Employment	123 (30.8)
War	225 (56.4)
Drought/flood	0 (0.0)
Education	4 (1.0)
To be with family	39 (9.8)
Other reasons	8 (2.0)

Marital status (n=399)	
Single	73 (18.3)
Married	297 (74.4)
Divorced	12 (3.0)
Widowed	17 (4.3)
Education level (n=399)	
None	146 (36.6)
Preschool (Khalwa)	53 (13.3)
Elementary	154 (38.6)
Secondary	34 (8.5)
University/above	12 (3.0)
Employment status (n=399)	
None	76 (19.0)
Temporal	98 (24.6)
Permanent	40 (10.0)
Housewife	158 (39.6)
Student	20 (5.0)
Retired	7 (1.8)
Family household income (n=399)	
Less than 200 SDG*	200 (50.1)
201-1000 SDG	179 (44.9)
1001-2000 SDG	20 (5.0)
Health service used during last year (n=399)	
Yes	301 (75.4)
No	98 (24.6)
If yes, where (n=301)	
Health centre	139 (46.2)
Hospital	147 (48.8)
Private clinic	15 (5.0)
Satisfaction with health service (n=300)	
Very satisfied	54 (18.0)
Satisfied	144 (48.0)
Relatively satisfied	68 (22.7)
Not satisfied	34 (11.3)
Traditional healers used during last year (n=399)	
Yes	116 (29.1)
No	283 (70.9)
Satisfaction with traditional healing (n=112)	
Very satisfied	13 (11.6)
Satisfied	58 (51.8)
Relatively satisfied	31 (27.7)
Not satisfied	10 (8.9)

* 100 SDG = 42 USD = 275 NOK

4.1.2. Frequency distribution perceived accessibility of health facility

The health facility preferred by the sample with regards to a set of potential barriers is shown in Table 4.3.

Table 4.3. Perceived accessibility of different health service (n (%)) N = 396

	Hospital	Private clinic	Traditional spiritual healer	Religious healer	Herbalist traditional healer
Expenses/affordability	334 (84.3)	35 (8.8)	6 (1.5)	6 (1.5)	15 (3.8)
Time	318 (80.3)	55 (13.9)	4 (1.0)	7 (1.8)	12 (3.0)
Distance	308 (77.8)	56 (14.1)	8 (2.0)	12 (3.0)	12 (3.0)
Understanding of disease	325 (82.1)	55 (13.9)	3 (0.8)	5 (1.3)	8 (2.0)
Available treatment	336 (84.8)	43 (10.9)	4 (1.0)	2 (0.5)	11 (2.8)
Emotional/psychological support	323 (81.6)	39 (9.8)	9 (2.3)	17 (4.3)	8 (2.0)
Adequate treatment	343 (86.6)	38 (9.6)	3 (0.8)	3 (0.8)	9 (2.3)
Service of choice if having a mental illness	332 (83.8)	49 (12.4)	7 (1.8)	2 (0.5)	6 (1.5)

Out of the total sample, more than 77% regarded hospital as the most accessible facility in terms of the criteria measured; 4 out of 5 participants (83.8%) named hospital as the most feasible service if they or someone in the surrounding area were suffering from a mental illness.

4.1.3. Explanatory models distribution

The following four tables provide an overview of the distribution of responses across the items in all four categories named in the MDEMQ.

Table 4.4 shows the frequency distribution of the responses on the 13 items in the MDEMQ Stress category across the 5-point Likert-scale used in the questionnaire.

Table 4.4. Frequencies MDEMQ category - Stress (n (%))

	Not at all likely	Somewhat unlikely	Neither likely or unlikely	Somewhat likely	Highly likely	N
Bad experiences in childhood	153 (38.6)	20 (5.1)	49 (12.4)	32 (8.1)	142 (35.9)	396
Exposure to fright or shock	131 (33.2)	23 (5.8)	53 (13.5)	41 (10.4)	146 (37.1)	394
Being harmed intentionally by another person	141 (35.8)	23 (5.8)	72 (18.3)	48 (12.2)	110 (27.9)	394
Unemployment	146 (37.2)	17 (4.3)	52 (13.3)	44 (11.2)	133 (33.9)	392
Death of relation or close friend	126 (33.2)	11 (2.9)	51 (13.5)	28 (7.4)	163 (43.0)	379
Migration	202 (51.4)	19 (4.8)	49 (12.5)	25 (6.4)	98 (24.9)	393
General life stress or trauma	73 (18.5)	21 (5.3)	48 (12.2)	66 (16.7)	187 (47.3)	395
Not having enough money	116 (29.4)	24 (6.1)	56 (14.2)	41 (10.4)	158 (40.0)	395
Conflict with family or friends	113 (28.7)	13 (3.3)	61 (15.5)	62 (15.7)	145 (36.8)	394
Pace of "modern life"	195 (49.7)	18 (4.6)	52 (13.3)	25 (6.4)	102 (26.0)	392
Breakup of family or failed relationship	95 (24.4)	9 (2.3)	48 (12.3)	72 (18.5)	165 (42.4)	389
Too much work or study	225 (57.4)	17 (4.3)	79 (20.2)	23 (5.9)	48 (12.2)	392
Having had an accident	164 (41.5)	12 (3.0)	68 (17.2)	54 (13.7)	97 (24.6)	395

Six out of the 13 items in this category were weighted as being more likely reasons for mental distress: "exposure to fright and shock", "death of relation or close friend", "general life stress or trauma", not having enough money", "conflict with family or friends" and "breakup of family or failed relationship". The remaining items were more often rated as unlikely reasons for mental distress.

The next table, Table 4.5, is an overview of the eight items in the MDEMQ category Western Physiology, and the amount of responses distributed over the five grades of likelihood provided by the questionnaire.

Table 4.5. Frequencies MDEMQ category - Western Physiology (n (%))

	Not at all likely	Somewhat unlikely	Neither likely or unlikely	Somewhat likely	Highly likely	N
Genetic or inherited defect	140 (36.1)	26 (6.7)	62 (16.0)	33 (8.5)	127 (32.7)	388
Infection	315 (80.2)	23 (5.9)	17 (4.3)	5 (1.3)	33 (8.4)	393
Physical illness	205 (53.2)	16 (4.2)	56 (14.5)	30 (7.8)	78 (20.3)	385
Disruption of vital organ	171 (43.8)	13 (3.3)	53 (13.6)	46 (11.8)	107 (27.4)	390
Brain damage or head injury	97 (24.5)	5 (1.3)	43 (10.9)	62 (15.7)	189 (47.7)	396
Bad nerves in the body	172 (44.0)	24 (6.1)	53 (13.6)	15 (4.1)	126 (32.2)	391
Effects of old age	221 (55.9)	23 (5.8)	56 (14.2)	20 (5.1)	75 (19.0)	395
Being born this way	245 (62.2)	16 (4.1)	71 (18.0)	19 (4.8)	43 (10.9)	394
Chemical imbalance in the brain	160 (41.0)	19 (4.9)	39 (10.0)	39 (10.0)	133 (34.1)	396

Only one item in this category stands out as being viewed a likely reason for mental distress: “brain damage or head injury”. The remaining items have more respondents rating them as not likely reasons, or the distribution of replies is equal for both extremes of the Likert-scale.

Table 4.6 shows an overview of the response distribution on the four items in the MDEMQ category Non-Western Physiology.

Table 4.6. Frequencies MDEMQ category - Non-Western Physiology (n (%))

	Not at all likely	Somewhat unlikely	Neither likely or unlikely	Somewhat likely	Highly likely	N
Body out of balance or harmony	211 (54.0)	5 (1.3)	53 (13.6)	28 (7.2)	94 (24.0)	391
Being hot (but not from fever or weather)	277 (70.7)	27 (6.9)	54 (13.8)	9 (2.3)	25 (6.4)	392
Movements of wind air flowing through the person's body	316 (80.0)	25 (6.3)	21 (5.3)	10 (2.5)	23 (5.8)	395
Eating food that is wrong for the person	313 (79.4)	19 (4.8)	33 (8.4)	10 (2.5)	19 (4.8)	394

The results of this category show unevenness in the responses; all of the items are clearly rated as “not at all likely”.

The last table in this section, Table 4.7, displays the response distribution on the 19 items in the last category in MDEMQ, the Supernatural category.

Table 4.7. Frequencies explanatory model of Supernatural (n (%))

	Not at all likely	Somewhat unlikely	Neither likely or unlikely	Somewhat likely	Highly likely	Total
Dangerous or unprovoked spirit	234 (59.2)	28 (7.1)	79 (20.0)	15 (3.8)	39 (9.9)	395
Spirit who was angry because someone did wrong	241 (61.2)	26 (6.6)	67 (17.0)	21 (5.3)	39 (9.9)	394
Someone unwittingly casting a spell	176 (44.7)	12 (3.0)	73 (18.5)	32 (8.1)	101 (25.6)	394
Contact with something or someone taboo	243 (62.5)	18 (4.6)	62 (15.9)	28 (7.2)	38 (9.8)	389
Doing the wrong thing during pregnancy	263 (67.4)	15 (3.8)	44 (11.3)	32 (8.2)	36 (9.2)	390
Bad luck or chance	225 (57.1)	4 (1.0)	71 (18.0)	27 (6.9)	67 (17.0)	394
Contact with something or someone unclean, contagious or polluted	257 (65.7)	12 (3.1)	66 (16.9)	19 (4.9)	37 (9.5)	391
Person's karma	230 (58.4)	20 (5.1)	60 (15.2)	18 (4.6)	66 (16.8)	394
Not doing proper rituals after giving birth	264 (66.8)	15 (3.8)	50 (12.7)	13 (3.3)	53 (13.4)	395
Seeing, hearing or feeling something ominous	244 (62.1)	24 (6.1)	54 (13.7)	16 (4.1)	55 (14.0)	393
Someone wanting to hurt a person, casting a spell	119 (30.2)	5 (1.3)	56 (14.2)	52 (13.2)	162 (41.1)	394
Someone wanting to hurt a person, engaging another person to cast a spell	142 (36.5)	5 (1.3)	70 (18.0)	50 (12.9)	122 (31.4)	389
Use of birth control against religion or culture	247 (63.5)	6 (1.5)	60 (15.4)	25 (6.4)	51 (13.1)	389
Astrological destiny	315 (79.9)	28 (7.1)	21 (5.3)	10 (2.5)	20 (5.1)	394
Bad or ominous sensations	278 (70.6)	32 (8.1)	51 (12.9)	10 (2.5)	23 (5.8)	394
Bad or ominous dreams	266 (67.5)	33 (8.4)	60 (15.2)	12 (3.0)	23 (5.8)	394
Doing the wrong thing when menstruating	277 (70.5)	26 (6.6)	54 (13.7)	14 (3.6)	22 (5.6)	396
Doing something forbidden by social or cultural rules	248 (62.6)	14 (3.5)	62 (15.7)	38 (9.6)	34 (8.6)	396
Person's soul leaving the body temporarily or becoming scattered	317 (80.1)	15 (3.8)	39 (9.8)	10 (2.5)	15 (3.8)	396

This table shows that most of the items in this category are rated as unlikely reasons for mental distress. However, three items stand out, those concerning the use of spells.

The four tables in this section show that the MDEMQ category that contains the most items graded as likely reasons for mental distress is Stress. Only one item in the physiology categories was found to be weighted as a likely explanation, while out of the 19 Supernatural items, all but two items were heavily weighted as not at all likely explanations for mental distress.

4.2. Demographic variables, accessibility and EM

Due to a non-normal distribution of the replies on the MDEMQ categories of Non-Western Physiology and Supernatural, non-parametric techniques for analysis were chosen for these categories, while parametric tests were conducted with the categories of Stress and Western Physiology.

Since the four categories have different numbers of items, the mean sum scores are not readily comparable. For the Stress category the potential minimum and maximum scores are 13 and 65 respectively. For Western Physiology: 9 and 45, Non-Western Physiology: 4 and 20, and for Supernatural: 19 and 95.

While the mean sum scores for each MDEMQ category are not easily comparable, a low mean indicates a low belief in that specific EM.

4.2.1. Socio-demographic factors

Table 4.8 shows the mean sum scores calculated in each of the MDEMQ categories. An independent sample t-test and Mann-Whitney U test was performed to reveal if gender had an impact on the outcome variable. For age, marital status and family size ANOVA and the Kruskal-Wallis Test were performed.

Table 4.8. MDEMQ categories across socio-demographic factors

Soc-dem factors	Category	N	Stress Mean (SD)	WP	Mean (SD)	N-WP Mean (SD)	Supernatural Mean (SD)
Gender	Male	164	38.63 (13.25)	23.07 (8.99)	7.09 (3.97)	40.13 (16.10)	
	Female	220	38.47 (13.93)	22.65 (9.44)	7.04 (3.84)	37.72 (15.54)	
Age	<=30	166	38.48 (13.86)	22.59 (9.29)	7.11 (3.73)	38.32 (15.68)	
	31-40	92	38.44 (13.65)	23.53 (9.42)	7.02 (4.18)	39.62 (16.22)	
	>40	126	38.70 (13.42)	22.65 (9.09)	7.01 (3.91)	38.67 (15.77)	
Marital status	Single	70	36.50 (13.81)	21.07 (9.05)	6.10 (2.96)	35.15 (14.13)	
	Married	288	38.94 (13.71)	23.42 (9.30)	7.37 (4.10)	39.91 (16.34)	
	Divorced	10	43.00 (11.94)	21.36 (6.96)	6.40 (2.59)	35.00 (10.84)	
	Widowed	16	37.29 (12.27)	20.94 (9.65)	6.06 (3.55)	36.12 (13.58)	
Family size	<=4	148	38.05 (12.66)	22.40 (9.11)	6.93 (3.73)	37.83 (15.19)	
	5-7	144	38.91 (13.90)	23.28 (9.03)	7.31 (4.12)	40.28 (15.79)	
	8+	92	38.78 (14.85)	22.83 (9.84)	6.87 (3.79)	37.82 (16.78)	

Gender

The t-test and the ANOVA were conducted to explore the impact of gender and age on the mean score on the MDEMQ categories of Stress and Western Physiology. The independent sample t-test was conducted to compare the mean sum score across gender for Stress and Western Physiology, while Mann-Whitney U was conducted for the categories Non-Western Physiology and Supernatural. With equal variances assumed for Stress across gender, no significant difference was found, $t(384) = .113$ (mean difference = .16, 95 % CI: -2.57 to 2.89). Western Physiology mean sum scores across gender, with equal variances assumed, showed no significant difference, $t(384) = .444$. The differences in the mean = .42, 95% CI: -1.43 to 2.27.

The Mann-Whitney U test revealed no significant differences in the scores in the categories Non-Western Physiology and Supernatural. The medians for females and males were 6 ($n = 220$) and 6 ($n = 164$), respectively in N-WP and 35 ($n = 220$) and 37 ($n = 164$) in SN. U in N-WP = 18032, $z = -.008$. In SN $U = 17436$, $z = -1.526$.

Age

One-way between-groups analysis of variance was conducted to explore the impact of age on the mean sum scores of Stress and WP. Subjects were divided into three groups according to their age; no statistical significant difference was revealed. Stress: $F(2, 384) = .013$; WP: $F(2, 384) = .355$.

The Kruskal-Wallis Test revealed no statistically significant difference across the age groups in the MDEMQ categories N-WP and SN. χ^2 was found to be .593 for N-WP and .560 for SN. Medians for both groups were 6 for the N-WP category, while the age category 31-40 recorded a higher median score ($Md = 39$) than the other two groups, which both recorded values of 35.

Marital status

ANOVA for Stress and WP across marital status revealed p-values of .364 and .186 respectively. $F(3, 384) = 1.064$ for stress and $F(3, 384) = 1.613$ for WP.

No statistically significant differences were detected in the sum scores as a result of the Kruskal-Wallis Test. $\chi^2(3, n = 384) = 6.640$ for N-WP, and $\chi^2(3, n = 384) = 5.661$ for SN. Medians in N-WP for single and widowed = 4, married = 6, and divorced = 6.50. For SN, the medians recorded were single = 31, married = 37 and divorced and married = 35.

Family size

The mean sum scores across family size in the category of Stress revealed an $F(2, 384) = .170$, and $F(2, 384) = .345$ for the WP-category.

A $\chi^2(2, n = 384) = .619$ was calculated for N-WP. Medians recorded were 6 for all groups.

For SN $\chi^2(2, n = 384) = 2.966$, with medians of 35 for the groups ≤ 4 and $8+$ and 39 for 5-7.

4.2.2. Cultural factors

The following table shows the results from ANOVA and Kruskal-Wallis Test conducted to reveal if any group differences in the four causative categories in the MDEMQ occurred due to cultural factors.

Table 4.9. MDEMQ categories across cultural factors

Cultural factors	Category	N	Stress Mean (SD)	WP Mean (SD)	N-WP Mean (SD)	Supernatural Mean (SD)
Area of origin before migration*	South	61	34.82 (13.66)	20.28 (8.50)	6.57 (3.85)	37.57 (16.79)
	East	26	41.23 (11.70)	23.19 (6.76)	6.88 (2.98)	41.04 (14.47)
	West	163	40.49 (13.50)	23.72 (9.11)	7.27 (4.04)	39.84 (14.90)
	North/Central	134	37.26 (13.87)	22.70 (9.99)	7.05 (3.90)	37.47 (16.68)
Reason for movement	Employment	114	37.62 (13.51)	22.34 (8.57)	6.55 (3.27)	37.58 (14.48)
	War	219	38.85 (13.77)	22.79 (9.43)	7.31 (4.01)	39.67 (16.30)
	Family reunion	39	38.08 (13.37)	22.59 (9.86)	6.18 (3.51)	34.26 (13.28)
	Other reason/ education	12	43.58 (13.45)	29.33 (8.85)	10.08 (6.29)	47.75 (22.26)
Years since movement from original area**	≤ 5	175	39.01 (13.63)	23.26 (9.36)	7.39 (4.06)	40.35 (16.57)
	6-9	81	38.79 (14.11)	22.52 (9.22)	6.46 (3.34)	34.79 (12.55)
	10+	128	37.74 (13.40)	22.44 (9.13)	6.98 (3.96)	39.06 (16.27)

*: $p < 0.05$, **: $p = 0.05$

Area of origin before migration

The ANOVA revealed a statistically significant difference across the four different groups corresponding to the area of origin before migration on the mean sum score in the MDEMQ category Stress, with $F(3, 384) = 3.490$, $p = .016$. However, the effect size, calculated using eta squared, was found to be .026, which is considered to be a small effect size (87). Post-hoc comparisons using the Tukey HSD test indicated that the mean scores of the participants from the south (mean = 34.82, SD = 13.66) differed significantly from the mean scores of the participants from west (mean = 40.49, SD = 13.50). Results in the category WP revealed an $F(3, 384) = 1.882$ and did not reach any statistical significance.

In the categories of N-WP and SN, the Kruskal-Wallis Test revealed no statistically significant differences between the groups. χ^2 for N-WP (3, $n = 384$) = 2.447, χ^2 for SN (3, $n = 384$) =

5.595. The participants whose origin was south recorded a lower median ($Md = 4$), than the remaining groups with medians of 6 on the sum score of N-WP. Also, in the category of supernatural, the group from the south recorded a lower median ($Md = 33$), with the group from north/central recording median = 35, and east/west: median = 38.

Reason of movement

No statistically significant difference was detected across reasons of movement, with $F(3,384) = .783$ for stress and $F(3,384) = 2.123$ for WP.

The Kruskal-Wallis Test for the categories N-WP and SN did not reveal any statistically significant differences. χ^2 for n-WP (3, $n = 384$) = 7.378, χ^2 for SN (3, $n = 384$) = 6.803. Median scores recorded in the category N-WP and SN ranged from 4 and 32 in the group who migrated to be with family, via $Md = 5$ and 35 for employment, $Md = 6$ and 38 for migration due to war and $Md = 9$ and 44 for other reason/education.

Years since movement from original area

Across the groups for years since movement from original area, no statistically significant differences were revealed after ANOVA. In the category of stress: $F(2,384) = .343$, for WP: $F(2, 384) = .360$.

For the category SN, the Kruskal-Wallis Test detected a statistically significant difference between the groups made up from how many years it has been since the participants moved from their original area. $\chi^2(2, n = 384) = 6.007$, $p = .050$. The difference was found to be between the groups ≤ 5 ($Md = 39$) and 6-9 ($Md = 33.50$), with $p = .014$, adjusted $p = .043$. However, the effect size calculated was .123. The median for the last group (10+) was 35.

In the category N-WP, $\chi^2(2, n = 384) = 3.458$, with a corresponding p-value of .177, which does not indicate any statistically significant difference in the EM concerning N-WP. Medians recorded for the groups are 6 for the groups ≤ 5 and 10+, while for the last group, 6-9 years, it was 4.

4.2.3. Education and income factors

The results from the ANOVA and Kruskal-Wallis Test run on education level, employment status and family income across the mean sum scores in the four MDEMQ categories are shown in Table 4.10.

Table 4.10. MDEMQ categories across education/income factors

Education/ income factors	Category	N	Stress Mean (SD)	WP Mean (SD)	N-WP Mean (SD)	Supernatural Mean (SD)
Education level	None	139	37.89 (12.87)	22.57 (9.10)	7.35 (4.12)	39.46 (15.94)
	Preschool (Khalwa)	52	38.19 (12.63)	22.55 (7.93)	7.04 (4.57)	38.58 (16.12)
	Elementary	150	39.94 (14.17)	23.80 (9.79)	7.08 (3.71)	39.18 (16.18)
	Secondary	32	34.82 (14.80)	20.55 (8.72)	6.31 (2.75)	34.73 (13.81)
	University/ above	11	40.33 (16.18)	21.17 (10.25)	5.27 (2.05)	36.25 (13.40)
Employment status	None/retired	79	35.48 (14.40)	22.00(10.14)	7.14 (4.21)	36.00 (16.56)
	Temporal	94	38.40 (13.37)	22.41 (8.70)	6.80 (3.85)	38.98 (15.99)
	Permanent	38	40.05 (13.44)	24.05 (9.77)	7.47 (4.34)	41.33 (16.13)
	Housewife	154	39.53 (13.45)	23.24 (9.20)	7.14 (3.77)	39.52 (15.49)
	Student	19	41.32 (12.54)	22.79 (7.34)	6.47 (2.88)	37.79 (12.99)
Family household income	Less than200	192	38.76 (13.56)	22.58 (9.22)	6.90 (3.88)	37.77 (14.85)
	201-1000	173	38.40 (14.05)	23.36 (9.20)	7.24 (3.94)	39.40 (16.47)
	1001-2000	19	37.55 (10.74)	20.60 (9.89)	6.95 (3.69)	42.55 (18.74)

Education level

The exploration of the impact of education levels on the EMs Stress and WP showed no statistically significant results. For Stress, $F(4, 384)$ was calculated to 1.164, while $F(4, 384) = 1.069$ for WP. The differences in means for the two categories:

The Kruskal-Wallis Test gave, for N-WP a $\chi^2(4, n = 384) = .403$ and for SN $\chi^2(4, n = 384) = .613$. The medians for the groups were, in the same order as the table and respectively across the categories: 6 and 37, 4 and 36, 6 and 37, 5 and 31, 4 and 35.50.

Employment status

Between the five groups of employment, ANOVA did not reveal any statistically significant differences in the categories of Stress and WP, with $F(4, 384) = 1.582$ and $F(4, 384) = .462$ respectively.

Group differences for N-WP and SN did not reach significant levels, with $\chi^2(4, n = 384) = .933$ (Md = 6 for every group), for N-WP and $\chi^2(4, n = 384) = 5.368$ for SN. Medians

recorded for the groups in this category were: none/retired = 31, temporal = 37, permanent = 36, housewife = 37, student = 35.

Family household income

In the Stress category ANOVA calculated $F(2, 384) = .088$, and $F(2, 384) = .946$ for WP, with $p > .05$.

The Kruskal-Wallis Test revealed $\chi^2(2, n = 384) = 1.138$ for n-WP and $\chi^2(2, n = 384) = 1.084$ for SN. Medians recorded for participants with “less than 200” were 6 and 36.50, 201-1000 = 6 and 36, 1001-2000 = 4 and 36.

4.2.4. Health service use and satisfaction

Table 4.11 shows the results from an independent sample t-test and Mann-Whitney U test performed to reveal if the use of health services or a traditional healer during the last year had an impact on the outcome variable. For the remaining independent variables, ANOVA and the Kruskal-Wallis Test were performed.

Table 4.11. MDEMQ categories across health service use

Health service factors	Category	N	Stress Mean (SD)	WP Mean (SD)	N-WP Mean (SD)	Supernatural Mean (SD)
Health service used during last year	Yes	292	38.97 (13.86)	23.04 (9.37)	7.30 (4.13)	38.88 (16.22)
	No	92	37.21 (13.80)	22.18 (8.85)	6.28 (2.91)	38.31 (14.53)
If yes, from where	Health center	136	39.50 (12.96)	22.99 (9.03)	7.51 (4.60)	40.83 (17.44)
	Hospital	143	37.87 (14.36)	22.61 (9.66)	6.98 (3.66)	36.87 (14.99)
	Private clinic	13	44.80 (10.04)	27.72 (8.92)	8.62 (3.71)	40.33 (14.34)
Satisfaction with health service	Very satisfied	53	41.35 (13.67)	23.80 (9.07)	7.81 (4.43)	40.11 (16.42)
	Satisfied	138	37.88 (12.74)	22.41 (9.18)	7.26 (4.14)	39.15 (16.59)
	Relatively satisfied	66	38.85 (14.47)	23.21 (9.05)	7.09 (4.25)	38.37 (16.47)
	Not satisfied	34	39.38 (14.82)	23.76 (11.19)	7.06 (3.46)	36.82 (14.36)
Traditional healer used during last year	Yes	113	39.45 (13.85)	23.48 (9.41)	7.79 (4.52)	40.26 (17.43)
	No	271	38.16 (13.55)	22.56 (9.18)	6.75 (3.56)	38.11 (15.07)
Satisfaction with trad healing	Very satisfied	13	42.08 (11.24)	27.85 (8.38)	7.77 (5.10)	45.62 (17.25)
	Satisfied	57	40.17 (14.17)	22.76 (8.70)	7.77 (4.59)	38.45 (15.23)
	Relatively satisfied	31	37.71 (14.15)	22.77 (10.24)	8.06 (4.64)	43.13 (22.00)
	Not satisfied	9	41.00 (13.02)	24.90 (8.74)	7.33 (3.46)	36.00 (11.06)
Service of choice	Hospital	321	38.35 (13.72)	23.11 (9.42)	6.98 (3.72)	38.57 (15.51)
	Private clinic	48	38.51 (13.02)	21.29 (7.30)	7.79 (4.83)	39.29 (16.08)
	Religious/trad healer	15	42.80 (13.80)	21.80 (10.86)	6.33 (4.20)	40.80 (21.65)

Health service used last year

An independent sample t-test was conducted to compare the mean sum score of the MDEMQ categories Stress and WP across the use of health services during the last year. Equal variance assumed, no significant differences were detected between the group who had sought treatment, $t(384) = 1.110$ and those who had not, $t(384) = .804$. The differences in the means were 1.767 for the first group and .868 for the second.

A Mann-Whitney U test detected no significant difference in the last two MDEMQ categories. The median score for participants who had sought help during last year was 6 and 36, while for those who had not it was 6 and 37 for the categories N-WP and SN respectively. For N-WP $n = 384$, $U = 12\,061.50$, $z = -1.558$ ($Md = 6$ for both groups). For SN $n = 384$, $U = 14\,554.50$, $z = .054$.

From where health service was sought: The results of ANOVA provided an $F(2, 292) = 1.975$. The mean sum scores in the category WP gave an $F(2, 292) = 2.052$, without reaching any statistical significance in any of the two categories.

The Kruskal-Wallis Test for the differences between the mean sum scores in N-WP and SN across the different places people had sought help showed no statistical differences. For N-WP $\chi^2(2, n = 292) = 3.056$. χ^2 for SN $(2, n = 292) = 3.371$. For participants seeking help at health centers, medians recorded were 6 and 37, hospital = 6 and 35, private clinic = 8 and 37.

Satisfaction with health service: The ANOVA revealed no statistically significant difference between the different groups reporting different grades of satisfaction with respect to their mean sum score on Stress and WP. For Stress, $F(3, 291) = .873$ and for WP, $F(3, 291) = .403$.

For the categories N-WP and SN, the Kruskal-Wallis Test detected no significant differences. For N-WP, $\chi^2(3, n = 291) = 1.420$ and for SN, $\chi^2(3, n = 291) = .749$. Medians recorded for the mean sum scores of N-WP were for the groups, very satisfied = 7, satisfied = 6, relatively satisfied = 5 and for not satisfied = 6.50, while for SN medians of 35.50, 36, 35 and 34 were recorded.

Use of traditional healer service last year

An independent sample t-test showed no statistically significant differences in the mean sum score across the use of a traditional healing service during last year. With equal variance assumed for both categories, $t(384) = .853$ for Stress and $t(384) = .903$ for WP.

A Mann-Whitney U test revealed no significant differences in the categories N-WP and SN across the use of a traditional healing service. For N-WP (Md = 7 for yes and 6 for no), $U = 13\ 635$, $z = -1.785$. For SN a median of 39 for participants who had sought help and 35 for those who had not were recorded, $U = 15\ 341$ with $z = -.868$.

Satisfaction with traditional healing: No statistically significant differences were found between the groups on the mean sum scores using ANOVA. For Stress, $F(3, 110) = .396$ and for WP, $F(3, 110) = 1.255$.

No significant differences were found on the mean sum scores of N-WP and SN across satisfaction with the service. For N-WP medians of 6 for the two first groups and 8 for the two last groups were recorded, with $\chi^2(3, n = 110) = .323$. For SN, (Md = 45, 38.50, 40 and 35,50 respectively according to table), $\chi^2(3, n = 110) = 2.150$.

Service of choice

ANOVA revealed no significant differences between the groups formed of choice of service if having a mental illness and mean sum scores on Stress and WP. $F(2, 384) = .763$ for stress and $F(2, 384) = .924$ for WP.

The Kruskal-Wallis Test detected no statistically significant differences in the categories N-WP and SN. $\chi^2(2, n = 384) = 1.285$ for the first and $\chi^2(2, n = 384) = .125$ for the latter. Medians recorded for the choice of hospital, private clinic and religious/traditional healer were 6 and 36, 6 and 37, 4 and 35 for the categories respectively.

Chapter 5 – Discussion

5.1. Summary of key findings

This study shows that the most common EMs of mental distress are “exposure to fright or shock”, “death of relation or close friend”, “general life stress or trauma”, “not having enough money”, “conflict with family or friends”, “breakup of family or failed relationship”, “brain damage or head injury” and “someone wanting to hurt a person, casting a spell”. Thus, the EM category that is the most common, based on the MDEMQ, is Stress. The main demographic variables influencing EMs were found to be the area of origin and the years since migration, with western participants reporting statistically significant higher beliefs in stress than southern participants. Participants who had stayed in Mayo for 5 years or less reported higher beliefs in Supernatural EMs than participants who had been living there for 6-9 years. The vast majority of the sample perceived hospital as the most accessible health facility in every way measured, and 84% preferred hospital as the healer of choice if suffering from a mental illness. Overall, the demographic factors measured explained little of the variance in the participants’ EMs, however area of origin before migration and number of years since migration were significantly associated with the EMs of Stress and Supernatural. Usage of health facilities was not found to have a statistically significant impact on the different categories of the MDEMQ, neither was the healer of choice for treatment of mental distress.

5.2. Explanatory models distribution

5.2.1. Stress

The finding that the most prevalent EMs were in the Stress category, and therefore “Western EMs” (53), supports the findings documented in previous studies from other countries (67;79;89). This pattern was also revealed in 50% of the sample responded that “not having enough money” was a likely reason for mental distress, which mirrors findings from settings with poor populations in Zambia and Uganda (2;79). Poverty is a significant problem in Mayo, where 50% of the participants in this study reported a total family monthly income of less than 85 USD/551 NOK. Members of the community committee in Mayo predicted this outcome, and attributed the prevalence of mental distress in Mayo to a lack of proper employment and income.

The findings of this study suggest that many of the people living in Mayo have witnessed the wars and conflicts that have affected Sudan for many years. This might explain the reliance on EMs concerning “exposure to fright and shock”, “breakup of family or failed relationship” and “death of relation or close friend”. The belief in these EMs implies that these are events that the participants could relate to in a greater fashion than some of the EMs more often being attributed to as EMs common in the Western world, such as “pace of modern life” and “too much work and study”.

“Breakup of family or failed relationship”, “death of relation or close friend” and “conflict with family or friends” implies that social conditions play an important role in the participants’ lives, and that these relations are attributed to having an impact on their mental health. A study in Uganda found similar reliance on social reasons for mental distress, with a quarter of their participants naming social conditions as reason for depression (79).

“General life stress or trauma” was an additional explanation for mental distress rated as likely. This too might mirror the life events of the population in Mayo, with the possible stressors of breaking up their home and move across the country, experiencing war and conflict or otherwise stressful external events. The EM can also refer to the daily events and struggles people are facing, which might, over time, run people down in an unhealthy fashion. The living conditions in Mayo, with low employment rates, low income, scarce resources and services might contribute to the belief in this exact EM. However, unemployment alone was not rated as a likely cause of mental distress, on the other hand, if added with other day-to-day struggles; this might be viewed as general stress.

5.2.2. Physiology

The items in the Western Physiology category of the MDEMQ is, along with Stress, categorized as Western beliefs of mental distress (53). Even though the findings suggest a significant belief in Stress, one EM in the Western Physiology category was found to be a plausible explanation for mental distress; “brain damage or head injury”. In the Non-Western Physiology category none of the items were rated as likely. This implies a general low belief in that physical conditions might affect the mental health, and that mental health is merely viewed as psychological and social, unrelated to physical states. This contradicts findings from surrounding countries where physical conditions have been cited as possible EMs (79;81). However, these studies focused on specific mental illnesses, rather than mental distress in general, as this study, which might have contributed to the pattern of replies. In Kenya, both social, physical/biological and supernatural causes were cited, but for different mental illnesses (81).

Non-Western Physiological EMs have previously been found to be prevalent in different Asian cultures (15;46;53), especially the EM concerning consumption of wrong food. The findings in this study implies that EMs found to be prevalent in other non-western cultures are not as prevalent in Mayo. However, 30% of the sample rated “body out of balance or harmony” as a likely explanation for mental distress. This item was found by Eisenbruch to relate to the WP-category through the item “chemical imbalance in the brain”, which had more than 40% of the sample rating it as likely. This finding implies that the population in Mayo has a much greater belief in western EMs than non-western. Reasons for this belief in western EMs can be either cultural background, or influence by interaction between the persons holding different EMs, through health education or through the media in general (46).

5.2.3. Supernatural

Three items regarding magical spells stand out in the Supernatural category of the MDEMQ. These items have a significant number of participants rating them as likely, while every other item in this category had a vast majority of responses on the other end of the 5-point Likert scale. This can be interpreted as the participants believe in the magical aspects of the supernatural, rather than the mystical or animistic (53).

In Sudan, the belief in spirits can be found both in the Muslim and Christian cultures (41). These spirits may possess individuals, and sets demands that needs to be fulfilled, either by the possessed or by his or hers relatives (41;83). For this reason, the finding that the participants ranged the items regarding spirits as unlikely was somewhat surprising. The lack of belief in spirits may be interpreted in light of the findings that most of the participants preferred hospital over other health services. The traditional healers in Sudan are respected both by their followers and by the government, thus there is a collaboration between these healers and medical facilities with mutual referral to cover the patients’ needs (41). Parts of their healing concerns helping possessed persons getting rid of this possession, so if the people display a low belief in spirits, this may lead to lower usage of traditional healers.

The existence of magical EMs in this study corresponds to findings from Zambia, where it was revealed a high reliance on the EM of witchcraft or God’s work (2). Studies have also found differences in the belief in spells for Zimbabwean, British African-Caribbean, white and Asian participants where the two first groups believed more in spells than the latter (44).

5.2.4. Demographic factors

The association of the demographic factors of age and gender were not found to be significantly associated with the MDEMQ causative categories, which is in contrast to

findings from similar studies. One such study found age to be a significant predictor of the MDEMQ categories of Stress and Supernatural, with younger participants holding a stronger belief in both categories than older participants, however discussion of this finding suggested it could result from a skewness in the sampling (75).

The mean sum scores across the two Western categories and the Non-Western Physiology were very similar across gender, with males reporting a higher score than the females in the Supernatural category. This is opposite to what has been found among Middle Eastern participants, where women relied more on a supernatural explanation than men (88). On the basis of the material collected in this study, it is difficult to reach a conclusion as to why this is so. Thus, despite the fact that the gender difference did not present any statistical significance, it might be a topic of interest for further research.

It was hypothesized in the literature that the degree of subscription to a supernatural causal category of mental distress might decrease with younger age. Possible reasons for this are that younger people often have a tendency to be influenced by peers with diverging views and different cultures, and also seek higher education. On the other hand, people of older ages might seek companionship with others similar to themselves, and be less susceptible to information and impulses (75). This, however, was not found in the current study. The manner in which the age groups were divided might have had an influence on this. The oldest age group in this study is over 40 years old, which might not be a high enough age difference between the youngest and oldest age group to detect any real difference in EMs across age. Nevertheless, the results could also be correct, showing that participants in this study agreed to the same levels on all four causative categories of the MDEMQ.

5.2.5. Cultural factors

Several researchers and studies have claimed and found that culture plays a significant role in both predicting and influencing EMs, a perception of illness and the causal attribution of the illness (45;55;61;75;80;90). Likewise, in the current study, culture in the form of area of origin and years since movement, was found to be statistically significant with different EMs. The area of origin before movement showed the strongest association with the MDEMQ category Stress; no statistically significant associations were found for the remaining three categories. The findings imply that people from the west of Sudan attribute mental distress more to stress than people from the south. This implies that cultural beliefs influence EMs also in this population. Across all categories participants from the south recorded lower beliefs than the other participants. This implies that the EMs held by the southern Sudanese in this study differ from the participants originating from the remaining parts of the country.

Even though this study did not explicitly ask participants about religion, it is known that the southern Sudanese are generally a Christian population, while the remaining population mostly adhere to Muslim religion (22). Different coping strategies can also influence how stressful events are perceived and attributed, which also may have influenced these results. On this background it is possible to hypothesize that different religious beliefs might have an influence on the differences in EMs found in this study. A study in Iran revealed few differences between three ethnic groups, which is the opposite of what was found in this study. Adherence to the same religion was one of the reasons listed as possible influences on the findings, along with political and educational structures and language (91). However, another study found that different ethnic groups of Chinese women differed significantly in their EMs (45). In this study, we did not ask the participants about religion or the specific area of origin due to the risk that participants might feel discriminated against if they revealed religious beliefs or from which tribe they originated. Thus, geographical direction was used as a predictor of culture in this setting, without discriminating between ethnicity, tribe or religion.

The number of years since movement from the area of origin was found to be significantly associated with the MDEMQ category of Supernatural. Levels of acculturation stress due to a loss of social network, language barriers, and discrimination, loss of employment or daily stability and socioeconomic status have been hypothesized as potential influences on EMs and attitudes towards specific health care providers. To what degree participants adhere to different cultures could affect the corresponding EMs (45;53). In this study, a significant difference in the EM Supernatural was found between participants who had left their original area five or less years ago and six to nine years ago, with the first group reporting stronger beliefs in Supernatural EMs than the latter. If this were to support the hypothesis about adherence to the culture of the present area, one would expect that the difference would be between the two groups who had stayed in Mayo for the shortest and longest time; however this was not the case. One possible reason for this counterintuitive finding could be that, despite the people in Mayo coming from all over Sudan, they tend to reside in Mayo with people from the same area originally. This can lead to the upholding of the beliefs that the participants brought with them from their original area, and would mean they are not subject to many differing cultural views on the specific topic of EMs regarding mental health. However, as we see a drop in the beliefs of Supernatural EMs between the two first groups, the group who had been in Mayo for the longest showed a greater belief in this category.

5.2.6. Educational and income factors

Previous studies have found education to be a significant predictor of EMs. One study conducted with both British and Pakistani participants found that participants with no or low

education levels believed more in supernatural causes of illness than participants with higher education (75). In the current study, education was not found to be a significant predictor of EMs; however the trend in the results shows the same pattern, with those with low education levels subscribing stronger to Supernatural and Non-Western Physiology than participants with higher education. The pattern is the opposite for the category of Stress.

Employment status was thought to measure some of the impact that life experiences have on EM, hence one of the items in the Stress category explicitly asks if unemployment could be a reason for mental distress (53). It was therefore hypothesized that participants without employment or with temporary employment would subscribe to the EM of Stress, due to the degree of stress that being unemployed can bring. However, no such association was found in this study. As a matter of fact, the participants without a job or with temporary employment scored the lowest means on the categories of Stress, WP and Supernatural.

As with unemployment, “not having enough money” is used as a measure on the level of the likelihood for subscribing to the Stress category. For family household income we could not find any association with any of the MDEMQ categories. The participants with the lowest incomes reported higher mean sum scores in the causative category of Stress, and lowest in Supernatural, without reaching any statistical significance.

5.2.7. Health service factors

Past use of different health services has been found to have an influence on where people choose to seek treatment, which is again influenced by different EMs (55). Studies have found that explanations of mental distress that include such phenomena as sorcery or ancestors' spirits may cause the mentally distressed patients to seek help from traditional healers, rather than medical services (55). A belief in “natural” causes of mental distress, as measured by the MDEMQ categories Stress and WP, tends to guide patients to medical services, while those subscribing to Supernatural EMs are less likely to seek help from such services (55). These findings were not supported in this study, where the service of choice was not related to any of the MDEMQ categories. Participants that reported they would seek the service of a traditional healer for mental distress reported higher mean sum scores on both Stress and Supernatural beliefs. On the other hand, when checking the medians for the Supernatural category, the value for supernatural beliefs and the traditional healer was declining; it was the lowest of the three groups. This could be explained by some participants recording high values on several of the questions in the Supernatural category, while the remaining participants recorded more moderate values, which then results in a misleading mean.

The finding that the choice of health service was not significantly associated with the different EM categories, and that approximately 80% of the participants would choose the hospital if suffering from mental distress, supports the finding in Fung's study that even though EMs may influence the attitude towards seeking professional help from specific health providers, this influence might only be significant with regard to which service is perceived to be accessible (45). However, research has suggested that subsequent or simultaneous use of health services can occur, which was not found in this study (76). In addition, since it has previously been found that the Sudanese tend to turn to THs for treatment, an attempt to answer in an "acceptable" manner could also have influenced participants' replies on this question.

Given that EMs have previously been found to influence satisfaction and adherence to treatment, it should be a goal for any clinician to make themselves familiar with these EMs in any type of consultation (12;18). This is also important for the health workers in and around Mayo. THs have previously been found to be the health worker preferred for emotional support since they share the general population's EMs more often than professionally trained clinicians (41). The majority of the sample in the current study regarded hospital as their choice of service for mental illness, which could enhance the importance of awareness among the staff of the influence EMs may have for an individual's experience with the service.

5.3. Health service utilization

When examining the sample characteristics, a few interesting aspects emerged. Between 78% and 87% of the sample chose hospital as the preferred health service in all the aspects of accessibility explored in this study. This is much higher than expected, particularly given that studies from other parts of Africa and the eastern Mediterranean region, as well as in Sudan, indicate and expect a widespread use of traditional healing (41;78;79;88). Also, the small proportion of participants who had made use of traditional healers during the last year (29.1%), compared to those who used other types of health services (75.4%) shows that the participants in this study preferred to make use of the services the hospital can provide.

Reasons for this unexpected finding could be that a hospital lies just outside the area where the data was collected, therefore, even though most of the participants had a low income, they were able to use the hospital's services. Consultations at this hospital are free, while medications can be, regrettably, expensive. However, the community leaders in Mayo enjoy reasonable respect outside the community and, hence, they could write a personal letter to the clinician asking for free treatment on behalf of a patient. It has not been possible to gain written confirmation of this information; however we were orally informed of this situation

from community leaders and the data collectors. Given that this study was conducted in a city with a hospital near the study site, it is difficult to generalize this finding to other parts of Sudan, where the nearest hospital may be at a significant distance from the homes of the population. On the other hand, this finding suggests that the Sudanese maybe would prefer a hospital's services whenever accessible.

5.4. Methodological issues

Several factors may have influenced the validity and reliability of this study. The following discussion will present and explore the possible influences and consequences.

5.4.1. Validity

Validity refers to whether a study actually measures the specific concept it is designed to measure. The literature divides validity into two categories: internal and external. External validity refers to whether the results are able to be generalized, and internal validity concerns the quality of the data (92). The MDEMQ has not been used previously to measure the EMs of a Sudanese population, however, it has been used in research with Asian immigrants in North America (45); British Asian, western European and Pakistanis in the United Kingdom (75), in addition to the research conducted by the author of the questionnaire (62;93-95).

The external validity of this study, through a randomized and representative sample, was ensured through the methods of the SMHP (see section 1.3.1.). The participants in this study were interviewed in the last days of the SMHP, which indicates that the sample in this study resembles the total sample of the SMHP. This may contribute to the opportunity to generalize the results of this study to the larger population in Mayo.

Several types of validity have been discussed in the literature as important when conducting research in general and specifically cross-cultural research. The most common are face, content, criterion and construct validity.

Face validity: This type of validity is a superficial assessment of the questionnaire to determine whether the instrument appears to measure what it is supposed to measure, whether the questions appear to be relevant for the topic of interest, and whether or not they are unambiguous (92). The questionnaire used in this study, the MDEMQ, was founded on work conducted by medical anthropologists and researchers who focused on EMs and cultural sensitivity (53). In conclusion, the face validity of the instruments seemed to be adequate. However, face validity is a weak assessment to determine the validity of a study.

Content validity: Content validity is a more systematic way than face validity to assess a study. If the content of the instrument seems logical to examine the concept, and it includes the full scope of the concept, the instrument can be judged to have content validity (92). It is a judgment of the operationalization of the concept, and whether this operationalization has translated the concept correctly (96). Content validity also focuses on whether the items in the instrument are relevant to the cultures where it is used (97). The categories of the MDEMQ were developed through multi-dimensional scaling analyses and were based on the work of several different frameworks proposed to classify EMs of mental illness in a significant number of cultures (64-66).

Criterion validity: Criterion validity involves comparing the results of the assessment with a “gold standard” (92). In cross-cultural research this gold standard would be cultural norms (97). However, this validity is difficult to test when no gold standard can be identified, as is the case in the current study (92). In cases like this, proxy measures can be used instead, which, in this study, will be to compare the findings with previous studies in the sample population, which have been done in previous sections. It seems, after reviewing the identified literature in the field of EMs, that the findings from this study are comparable to other studies focusing on EMs.

Construct validity: In cross-cultural research this type of validity is a way of determining whether the underlying construct or concept, as measured by the instrument, has the same meaning in this specific culture as in the cultures where this measurement has been used (97). One can test construct validity by looking at whether expected differences between groups actually exist with regards to the characteristic in focus (92). The MDEMQ has found that, like other instruments assessing EMs, culture, age, religion and gender might influence what EMs participants subscribe to (44;45;75;84-86).

Construct validity was tentatively ensured by conducting a pilot study followed by a thorough discussion around the different items of the MDEMQ. Following the pilot, some comments were raised among the participants about three of the items, although the items in question remained in the final questionnaire, after discussion with and advice from local mental health professionals, due to the small number of participants raising the questions. In hindsight, these three items were of little importance to the study, and could have been removed from the questionnaire. However, this was impossible to know beforehand, hence after thorough discussion with local mental health workers it was decided to keep the questionnaire in its original form. In addition, a few participants chose to omit their responses to these items, with

10 missing replies on “contact with something or someone taboo” and three missing for “person’s soul leaving the body temporarily or becoming scattered”.

An additional two types of validity, or equivalence, have been mentioned as important when conducting cross-cultural research: semantic validity and technical validity.

Semantic validity: This type of equivalence involves ensuring that the original meaning of the items in the instrument is maintained through translation and adaptation (97). An Arabic version of the MDEMQ was not identified when planning this study; hence a translation and back-translation were conducted. Additionally, a pilot was conducted where participants were encouraged to give feedback on the wording of the questions. Chapter 3 of this thesis provides an overview on how the translation and pilot were conducted.

Technical validity: Technical validity covers whether the method of choice affects the results in different cultures (97). The MDEMQ is a quantitative assessment of EMs and has, as previously mentioned, been implemented with participants from various. In this study the participants were interviewed which could have an effect on the data due to various types of bias. However, due to the low literacy rate among the participants, an interview was the only feasible method for this study.

Bias: The results of this study may have been subject to different types of biases. Participants were former IDPs, who have now had their political status changed to semi-settlers, which is a selection bias that may limit the generalizability to the greater Sudanese population. However, the results may possibly be generalized to the greater population of Mayo. Sampling bias was evaluated as being insignificant due to the small number of potential participants who were invited to participate that declined to do so, however, sampling bias could be a matter of the distortion of data in every cross-sectional study (96).

Response bias can occur in any research setting that involves human subjects. Participants may answer questions in a way they think the researcher wants them to reply. This can be due to a need to act in a socially desirable way, and may involve the participant over-reporting what they think will be more “acceptable” and under-reporting “unacceptable” behaviors or thoughts. With regards to the socio-demographic part of the questionnaire, areas that are believed to be sensitive to this bias include income and religion/personal beliefs. In terms of the MDEMQ, responses regarding personal beliefs about supernatural causes of mental distress could be affected by the fact that the participants might devalue the legitimacy of believing in supernatural causes, and therefore downplay their beliefs in these questions and enhance their responses to others. Another aspect that can add to the

response bias and social desirability is that the data collectors are all educated persons (psychologists), while many of the participants had low levels education and are, for different reasons, subject to discrimination in the labor market. This can contribute to a power-imbalance that might influence participants' responses to different questions in the questionnaires. Even though no systematic missing values were discovered in this study, some participants chose not to answer some of the items; this could be another example of social desirability, avoiding the possibility of answering in a false way or admitting something that might be viewed as undesirable.

Recall bias is another source data distortion. Some of the questions in the socio-demographic part of the questionnaire may have been subject to this bias; however recall bias is not thought to influence the results of this study significantly, due to the nature of the questions in the MDEMQ.

In conclusion, the findings in this study may have been subject to different types of biases, which can threaten the validity. Given that interviews were performed to collect the data, it is not possible to rule out that replies can have been given in favor of replies considered as more "acceptable". We do not know if the different EMs may have been subject to under- or over reporting. An attempt to reduce the response bias was made by excluding questions directly asking for religion and tribe, topics that are discussed with much care in Sudan. However, the instrument was piloted in a sample similar to the study sample, which reduces the threat to semantic and technical as well as construct validity. In addition; the MDEMQ has previously been used in different cultures, and the concept EMs have been elaborated upon among several different populations, with findings supporting the findings in this study.

5.4.2. Reliability

The internal consistency for the MDEMQ categories was calculated, with the use of Cronbach's Alpha, to be between 0.75 and 0.9, which is considered an adequate internal consistency (87;92). Other studies using the MDEMQ include Sheikh and Fung who found Chronbach's Alphas ranging from 0.79 – 0.95 (45) and 0.71 – 0.95 (75). In this study, Chronbach's Alpha was found to be within the same range.

The research tool: Several of the instruments developed for elaboration of EMs are meant for clinical populations (44;46;84), however it has been argued against use of such instruments due to time consumption, which may constrain the practitioner to thoroughly elaborate upon the patient's EMs, or performing other needed assessments (84). Questionnaires assessing illness perceptions, rather than EMs, are often possible to administer in a shorter time. A problem with these questionnaires is that they often concern

the etic concepts about illness, rather than the emic, which may not detect the cultural variations in the population (84).

Critiques towards the assessments of EMs have also been addressed to the difficulty assessing general populations EMs with questions aimed at clinical participants. However, the MDEMQ is aimed at surveying non-clinical participants (45;53), contrary to the instruments mentioned above.

Use of research assistants in medical research: The use of research assistants is a common method for gathering data, with this study being no different. Firstly, the SMHP had, due to the large sample size of their study, trained psychologists from Sudan to perform the interviews with the participants. Secondly, the language and culture barrier made it impossible for the PI to collect the data on their own. The research assistants were Sudanese nationals who provided a vast amount of insight and understanding into Sudanese culture and traditions. However, in research it can sometimes be a positive attribute to not know too much about the culture, to enable to researcher to see what locals might take for granted. The education of the data collectors can also inhibit a fruitful relationship between them and the participants. Many of Mayo's inhabitants are very poor, with low education levels, which can create a significant power distance between the psychologist and the participant. Having said this, psychologists are trained to perform different types of interviews in different types of settings, without loading the questions. In this study, the data collectors were followed by a local guide from Mayo, so they would be able to find their way back to participants from the baseline study. These guides were also present when conducting the interviews and some of the participants also had family members with them. In cultures where intimacy and crowdedness are a choice, this might raise the question of whether the responses were made in an earnest fashion. However, in Mayo intimacy is not a choice, as large families live in small spaces. This can contribute to lower the risk of self-awareness and possibility that replies have been adjusted to please the interviewer.

The research assistants were 10 psychologists of both genders. However, since they interviewed several participants from the same household, the matching of genders between assistant and participant was not possible. Thus, an additional imbalance in power relations may have been present, which could affect the validity of the results. Additionally, the subject of ethnicity is important in Sudan. The research assistants originated from all over Sudan and, therefore, could have had a different tribal background to the participants, which could either increase or decrease the power imbalance.

Given that the interviews were conducted in Arabic, the PI had little knowledge on how the questions and answers were formulated in the interview setting. In addition, being an obvious outsider and foreigner, entering participant's homes with the research team could have increased the difficulties with power relations even further. The issues of political and religious agendas were raised after the first day of data collection. The community committee was contacted by a community member who did not approve of a foreigner visiting participants' homes, and expressed a fear that the PI would conduct missionary work for specific religious and political views during the interviews. As a result, it was advised that the PI did not participate in the data collection more than the first day. However, PI was enabled to be present in Mayo, though not to be present during the interviews, through the hospitality of the community committee in Mayo, Block II, who provided the base for the data collector team. In consequence PI was able to talk with the team both before and after the data collection each day, and to learn about the experiences the responses and reactions of the participants. This contributed to PI's knowledge about the process of the data collection, without being able to stay present in the situation.

In conclusion; the training and the education of the data collectors may have influenced the reliability in this study. The education may influence participants' replies, in terms of which EMs are rated as likely or not. Interviewers both from Mayo, or with a similar background to the participants, may have imposed less power imbalance in the interview situation, and hence possibly elicited more "true" ratings, if such exists. However, psychologists are trained in conducting different interviews, and to contribute to the interview situation in an ensuring fashion, to enhance the possibility of eliciting replies true to the participants' meaning. Hence, the reliability of the study appears to be satisfactory.

5.4.3. The use of the concept explanatory models

Several models and theories can be used to elaborate upon illness beliefs and EMs; a considerable amount of research has been conducted using these different frameworks. In this study we chose to use EMs due to the recognition of cultural differences in terms of how people think of and evaluate mental distress, and to facilitate a comparison (although possibly a narrow one) with EMs elaborated upon from various parts of the world.

Even though EMs have, in many parts of the world, been found to contribute to how people think of seeking treatment from specific health care providers, it is a concept that has been, and still is, subject to challenge and discussion. However, awareness about a patient's EM and the possible impact this EM(s) might have, can help the clinician to better understand what treatment will be most appropriate for the patient (49). Furthermore, knowledge about

EMs and the perceived corresponding treatment can help in avoiding non-adherence to treatment (46;60;80;98).

Attitudes and beliefs are constantly re-evaluated and reappraised, which can make EMs changeable and inconsistent and subject to individual variances. EMs held by one person might also be fragmentary and sometimes contradictory, which have been raised as a critique of EMs (82). When viewed in this fashion, it can be difficult to claim that people make treatment choices based on a clear knowledge of their EMs, or that these EMs are established and unchangeable. Rather, some researchers have claimed that to view EMs as explanatory maps would be more fruitful, to visualize the fluidity of illness conceptions and beliefs (56). On the other hand, findings have also suggested that some groups, in this case patients suffering from schizophrenia, held stable health beliefs over time (99).

When appreciating that EMs can change; the influence from significant others in the form of information, attitudes, knowledge, reasoning and culture stand out as even more important when it comes to help-seeking and adherence to treatment (75;78). Also, attitudes and beliefs may change as a consequence of time passing and situational changes, as noted by Williams and Healy (56), among others, who found that EMs were sometimes different before and after a diagnosis (49). Thus, knowledge about a person's EM is not necessarily enough to predict help-seeking behavior alone, as it often a social action, where different peoples' explanations and beliefs about illness play a role (78). Other aspects of the system around a person might also contribute to influence their EMs and help-seeking behavior, such as the accessibility of the preferred treatment (45;82). However, EMs have, as previously stated, been found to play a significant role in determining help seeking and evaluation of the magnitude of mental distress (46;55;61;67).

Despite the fact that the concepts and the terminologies of EMs are subject to discussion regarding their validity and necessity, EMs have been found to be very much influenced by culture. The way people explain mental distress might have an impact on if and from who treatment or guidance is sought, and whether the treatment suggested is viewed as feasible (52;80). Knowledge about a patient's EMs in a clinical setting can contribute to better communication and understanding, which may influence compliance and satisfaction with care. Usage of a clinical instrument for assessment of persons' mental health without considering cultural beliefs and attributions may therefore result in a misunderstanding between the patient and practitioner regarding symptoms, illness, causes of the illness, treatment and timeline of the treatment. On this background, the literature suggest the

importance of assessing both patients' and general populations' EMs to ensure compliance and quality of care (2;46;60;79).

5.5. Limitations and strengths

As a consequence of the cross-sectional research design, cause and effect cannot be measured in this study. The literature review was conducted only from journals published in English, which may have excluded similar research conducted in Sudan published in Arabic or French.

The MDEMQ has been used in previous studies; however, those studies were not conducted in a similar fashion. Fung and Wong's study with East and South-East Asian immigrants to North America used 46 items (45); Sheikh used a 42-item version (75), while in the current study the original 45-item questionnaire was used. Nevertheless, the results from these studies should be comparable to the current study. Also, these studies focused mainly on the influence of EMs on attitudes towards seeking professional help, while the current study wished to elaborate more on the factors that can influence the EMs.

The questionnaire used in this study asks participants about their EMs regarding mental distress in general. The literature from the field suggests that focusing on one specific mental illness could alternate some EMs due to a more specific idea about the illness.

Eisenbruch advised researchers to arrange the order of questions so that relatively familiar items for the participants were asked first (53). However, since the EMs of the population in this study were previously unknown, we were not able to balance the questionnaire in such a fashion. For this reason, the different items contributing to the different causative categories were placed in the questionnaire at random. This may have had some impact on the reliability, since different orders of the questions may contribute to different ratings of the items. Regardless of the order in the presentation of the EMs; whether a person believes in an EM or not will most likely still be clear to that person, thus, the reply may still be in favor of that belief.

Using a one-way ANOVA to analyze the data has its limitations. Running a series of ANOVAs can increase the risk of Type 1 errors, namely the identification of a difference between the groups when in fact there was none (87). Therefore, previously mentioned studies using the MDEMQ analyzed their material using a multivariate analysis of variance (MANOVA) (45;75). This can be done on the mean sum scores of the questionnaire seeing as the four dependent variables (the causative categories) are related. However, since transformation of the distribution in the latter two categories of the MDEMQ failed to create a

more normally distributed variable, it was decided to conduct a series of t-tests and ANOVAs with their corresponding non-parametric tests for the two non-normally distributed mean sum scores.

The usage of a non-parametric statistical test also contributes to the limitations of this study. These tests tend to be less sensitive in detecting differences between groups where a difference actually exists, which can lead to potential Type 2 errors. A Type 2 error is the risk of not rejecting the null hypothesis when in fact there is a difference between the groups in question (87). Non-parametric tests do not compare the means of the groups, but rather the medians; the tests rank the continuous variable which means that some variance in the data can be missed (87).

There are a number of strengths to this study that should be acknowledged. Firstly, the material gathered adds to the limited research on EMs within the Sudanese population. Given that one of the main, long-term aims of the SMHP is to provide a wider mental health service for the research participants and the wider population in the study sites, the current study can raise the awareness of health workers to which EMs the population of Mayo subscribe to. Additionally, to explore which EMs were more prevalent, analysis was conducted to reveal which personal factors were associated with specific categories of EMs. In the literature, EMs have often been viewed as factors that can influence attitudes towards seeking professional help, rather than treating EMs as a dependent variable. By using EMs as a dependent variable, we were able to gather more personal factors to investigate further possibilities of influence on EMs.

The sample was randomized through the methods of the SMHP, which enables generalization to the population in Mayo, and also, to some extent, to IDPs in areas surrounding Khartoum.

Even though qualitative methods could, as discussed earlier, have provided more extensive knowledge about EMs not covered by the MDEMQ, a cross-sectional study in this setting creates generalizable information which can prove valuable in the promotion of mental health and educating health workers.

An additional strength of the study is that the data was collected by psychologists who had extensive training and experience in interviewing people on potentially sensitive subjects.

Chapter 6 – Conclusion

6.1. Conclusion

The purpose of this study was to assess the EMs of the population in Mayo, Khartoum. The demographic factors of the population, along with the EMs, were the focus of this study, with the objectives to explore the prevalence of specific EMs to explore which demographic factors influenced different EMs, which EM was the most prevalent in the population, and if a perceived accessibility of health services influenced participants' EMs.

The findings of this study imply that various EMs are present among the population in Mayo, and that some of the groups differ significantly in their reliance on specific EMs. Culture and the beliefs that flow from it influence how events are perceived and judged, and determine what actions are best to counter the event. The cultural meanings of an illness, therefore, are important for ensuring that the clinician and the patient understand and interact with each other in a fruitful manner.

The results of this study suggest that the main factors influencing EMs are the area of origin and the number of years since migration, and that the preferred service of choice for treatment for mental distress is hospital, however the service of choice was not found to influence the EMs. The most prevalent explanation for mental distress was found to be stress, but magical EMs were also found to be present. Even though it has been argued that EMs are unstable and changeable, there is still reason to believe that these results give an indication of the orientation towards a causal category of EM. Thus, while people may change their detailed EM, it may still remain relatively focused in the one category.

Despite the fact that the use of traditional healers is very common in Sudan in general, in this specific population this was not found to be the case.

6.2. Recommendations and suggestions

Clinicians who work with mental health in different settings need to be aware that people may subscribe to different EMs, and that the suggested treatments or explanations for an illness might not always correlate positively with a patient's belief; thus, the clinician must consider the emic approach to causal explanations for mental illness. This awareness on the part of the health workers may be even more important when the background of the patient and clinician are not the same. Therefore, a study with a clinical population and the impact of different EMs on satisfaction with treatment, adherence and clinical outcomes could reveal

valuable information for a clinician. The consideration of the EMs of mental illness can be of value when training health workers and designing mental health services.

Religion has previously been found to be a significant predictor for various EMs (75;100). A study that elaborated further upon the role of religion both in EMs and as a potential coping strategy could enlighten any aspects that have not been covered in the present study. A qualitative study design could prove valuable in this aspect, as well as in exploring any EMs not covered by the MDEMQ that are held by the Sudanese population.

This study is cross-sectional which reveals EMs at just one point in time. A longitudinal study could elaborate upon how or if these EMs change over time, what factors influence these changes, and also if there were any patterns in the changes.

Even though gender did not show a statistical significance in this study, males showed an elevated score in the category of Supernatural. Further research could explore whether this is an actual finding and, if so, why.

6.3. Contribution to knowledge

This study has mapped the EMs of part of a population where preliminary findings of the SMHP suggested a high prevalence of mental distress. The study informs both stakeholders and project leaders of the SMHP, as well as the MoH, Department of Mental Health, about the existing categorical EMs in a population that has been subject to mapping for mental illness and is a place where efforts have been made to meet the needs of inhabitants.

The head of Mental Health Division at the FMoH in Sudan will use the knowledge produced by the present study to better inform health workers and as indicators in future psycho-education and mental health campaigns in the Central State.

The study revealed that even though earlier studies found traditional healing to be widely used among the Sudanese population, this was not the case for the population at hand. The structural barriers faced by many Sudanese, such as the lack of formal health facilities, were not faced by the population of Mayo.

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Appendix I: English version of the questionnaires

QUESTIONNAIRE:

IDENTIFICATION NUMBER: (.....). **HOUSEHOLD NUMBER:** (.....).

- **INFORMED CONSENT:** YES (.....)
- **Age:** (----- YEARS).
- **Gender:** (1) MALE. (2) FEMALE.
- **Place of Origin (Area in Sudan):** (1) NORTH. (2) SOUTH. (3) EAST
(4) WEST. (5) CENTRAL.
- **DISPLACEMENT :** (1) YES. (2) NO.
- **REASON OF MOVEMENT:** (1) EMPLOYMENT (2) WAR
(3) EDUCATION. (4) TO BE WITH MY FAMILY (5) FAMINE/DROUGHT.
(6) OTHERS. (Specify.....)
- **HOW LONG TIME SINCE YOU LEFT YOUR ORIGINAL AREA.....** Years
- **Marital status:** (1) SINGLE (2) MARRIED (3) DIVORCED (4) WIDOWED.
- **Family Size:**Persons-
- **Highest educational level achieved:** (1) NONE. (2) KHALWA (3)
ELEMENTARY . (4) SECONDARY. (5) UNIVERSITY OR ABOVE.
- **Employment status:** (1) NONE. (2) TEMPORAL. (3) PERMANENT .
(4) HOUSE WIFE. (5) STUDENT. (6). RETIRED
- **What is your family household income (monthly) in Sudanese Pounds (SDG):**
(1) Less than 200 (2) 201-1000 (3) 1001-2000.
- **Health Service Use during last year:** (1) NONE. (2) HEALTH CENTRE.
(3) HOSPITAL. (4) PRIVATE CLINICS.
 - **If Yes: How satisfied are you with the care and overall quality of services you received?**
() Very Satisfied. () Satisfied. () Relatively Satisfied. () Not Satisfied.
- **Traditional Healers Use during last year:** (1) YES. (2) NO.

- **If Yes: How satisfied are you with the care and overall quality of services you received?**

() Very Satisfied. () Satisfied. () Relatively Satisfied. () Not Satisfied.

ACCESSIBILITY

Which of the health services are accessible for you in terms of:

	Hospital	Private clinic	Traditional spiritual healer	Religious healer	Herbalist traditional healer
Expenses/affordability					
Time					
Distance					
Understanding of disease					
Available treatment					
Emotional/psychological support					
Adequate treatment					
Service of choice if having a mental illness					

MDEMQ.

Mental Distress Explanatory Model Questionnaire.

Many people suffer mental distress at some time in their lives. Such distress can be mild or severe. People can experience and manifest mental distress in many ways. Sometimes they feel sad or anxious. Sometimes they are unable to cope. Or sometimes they are out of touch with what is going on around them. They may have experiences of strange beliefs. Sometimes their behavior becomes disorganized. They may become destructive toward themselves or others.

How likely is it that each of the listed causes could contribute to mental distress? There are no right or wrong answers.

Please grade your opinion on the listed different causes of mental distress:

1. Bad experiences in childhood

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

2. Exposure to fright or shock

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

3. Being harmed intentionally by another person

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

4. Genetic or inherited defect

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

5. Infection

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

6. Physical illness

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

7. Dangerous unprovoked spirit

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

8. Spirit who was angry because someone did wrong, e.g., did not honor it

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

9. Unemployment

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

10. Someone unwittingly casting a spell, e.g., evil eye

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

11. Contact with something or someone taboo

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

12. Doing the wrong thing during pregnancy

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

13. Disruption of vital organ, e.g., liver/blood/bone

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

14. Body out of balance or harmony

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

15. Bad luck or chance

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

16. Contact with something or someone unclean, contagious or polluted

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

17. Death of relation or close friend

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

18. Migration

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

19. Person's karma

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

20. Not doing proper rituals after giving birth

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

21. Brain damage or head injury

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

22. General life stress or trauma

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

23. Not having enough money

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

24. Seeing, hearing or feeling something ominous

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

25. Bad nerves in the body

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

26. Effects of old age

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

27. Conflict with family or friends

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

28. Someone wanting to hurt a person, casting a spell

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

29. Someone wanting to hurt a person, engaging another person to cast a spell

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

30. Use of birth control against religion or culture

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

31. Pace of “modern life”

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

32. Breakup of family or failed relationship

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

33. Too much work or study

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

34. Being born this way, e.g., inheriting bad blood

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

35. Having had an accident

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

36. Chemical imbalance in the brain

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

37. Being hot (but not from fever or weather)

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

38. Movements of wind/air flowing through the person's body

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

39. Eating food that is wrong for the person

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

40. Astrological destiny

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

41. Bad or ominous sensations

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

42. Bad or ominous dreams

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

43. Doing the wrong thing when menstruating

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

44. Doing something forbidden by social or cultural rules

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

45. Person's soul leaving the body temporarily or becoming scattered

Not at all likely - Somewhat likely - Neither likely nor unlikely - Somewhat likely - Highly likely

1 2 3 4 5

Appendix II: Arabic version of the MDEMQ

الإستيبيان / النموذج التوضيحي للإضطرابات النفسية

كثير من الناس يعانون من الإضطراب النفسي في وقت ما من حياتهم يمكن أن تكون هذه الإضطرابات خفيفة أو شديدة ، وكثير من الناس يمرون بمثل هذه الحالات أحياناً أو حتى الشعور الحزن أو القلق . في بعض الأحيان لا تكون هنالك قدرة على مواجهة المواقف . وفي بعض الأحيان لا تكون لهم أي صلة أو قرابة بأسباب الأزمة ، وقد تكون لديهم خبرات ومعتقدات غريبة. أحياناً يصبح سلوكهم غير منتظم . ويمكن أن تصبح حياتهم مدمرة تجاه أنفسهم والأخرين . ماهو احتمال ن اي واحد من الأسباب المذكورة يمكن أن تسهم في الأضطراب العقلي ؟ لا توجد إجابات صحيحة او خاطئة وضح :

الرجاء وصف رأيك على الأسباب المختلفة الواردة من الإضطراب العقلي					
	ليس من المرجح على الإطلاق (1)	من غير المرجح الى حد ما (2)	محتملاً أو غير محتمل (3)	من المرجح الى حد ما (4)	من المرجح جداً (5)
1	التجارب السيئة في مرحلة الطفولة				
2	الخوف أو التعرض لصدمة				
3	التعرض للأذى من قبل شخص آخر عمداً				
4	جينات أو عيب موروث				
5	عدوى				
6	المرض الجسدي (عضوي)				
7	أرواح خطيرة غير مبررة				
8	أرواح غاضبة بسبب عمل أخطاء(مثل عدم الوفاء بالوعد)				
9	البطالة				
10	إصابة شخص لك عن غير قصد(مثل العين)				
11	التواصل مع شخص أو شيء محرم				
12	فعل شي خاطئ أثناء الحمل .				
13	خلل/ إضطراب في عضو حيوي – (الكبد/الدم/ العظم)				

14	إختلال توازن أو تناغم الجسم .					
15	سوء الحظ أو ضياع الفرص					
16	إتصال مع شي أو شخص نجس أو ملوث .					
17	موت أحد الأقرباء أو صديق مقرب .					
18	الهجرة .					
19	عاقبة الأعمال الأخلاقية لشخص ما .					
20	عدم إتباع الطقوس الصحيحة عقب الولادة					
		ليس من المرجح على الإطلاق (1)	من غير المرجح الى حد ما (2)	محتملا أو غير محتمل (3)	من المرجح إلى حد ما (4)	من المرجح جداً (5)
21	تلف في الدماغ أو إصابة الرأس .					
22	ضغوط الحياة العامة أو صدمة					
23	عدم توفر مال كافي					
24	رؤية أو سماع أو إحساس بأشياء سيئة					
25	الأعصاب التالفة في الجسم					
26	أثار الشيخوخة (تقدم العمر)					
27	الخلاف مع العائلة أو الأصدقاء					
28	ممارسة السحر (العمل)					
29	إشتراك عدة أشخاص لعمل السحر					
30	إستخدام وسائل منع الحمل ضد الدين أو خلافاً للتقاليد					
31	تسارع الحياة المعاصرة (الحديثة)					
32	تفكك الأسرة أو فشل في العلاقات الإجتماعية					
33	الإفراط في العمل أو الدراسة					

34	أن يولد الشخص هكذا مثل أن يورث دماً فاسداً					
35	التعرض لحادث					
36	إختلال كيمياء المخ					
37	الإحساس بالسخونة (ليس من حمى أو طقس)					
38	حركة الريح / أو الهواء على الجسم					
39	تناول طعام فاسد .					
40	المصير الفلكي أو الأبراج					
41	أحاسيس سيئة					
42	أحلام سيئة					
43	فعل شي خاطئ عند المحيض (الدورة الشهرية)					
44	فعل شي محرم منافي للعادات أو التقاليد					
45	خروج الروح من الجسد أو تبعثرها					