PREVALENCE AND PATTERNS OF HERBAL MEDICINE USE AMONG CHILDREN AGED 0-12 YEARS ADMITTED TO KISII LEVEL 5 HOSPITAL

BY

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DECLARATION

I declare that this dissertation, in part fulfillment of MMed (Paediatrics and Child Health), is my original and has not been presented to any other university or forum.

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DEDICATION

To my loving wife Rose and our extraordinary daughter Hawi, I dedicate this to you for being such an inspiration.

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I would like to express my sincere appreciation to:

1. Almighty God, for life and health.

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Key terms and phrases

1. CCHEP

Acronym for Community Child Health Elective Program

This is an elective program in child health for paediatric residents from the University of Nairobi and University of Washington, Seattle, USA. It aims at exposing residents to various aspects of child health at the community level. Participating institutions are the 2 universities mentioned, KEMRI, Kisii Level 5 Hospital and Ministries of Public Health and Medical Services. Each pair of residents does a cycle, usually about 8 weeks.

Cycle 5 was done by Dr. Sam Oula (The Principal Investigator in this research) from the University of Nairobi, and Dr. Katie Simon, from the University of Washington, and was in August to October 2010.

2. Some key terms in Gusii

The Gusii people have various forms of traditional healers, with each group playing a distinct role in the community. Some of the common ones are listed below.

Abanyamoriogi- herbalists, who treated many illnesses with herbal remedies.

Ababari- indigenous surgeons, famous for being able to carry out craniotomies in a completely traditional setting.

abaragori –diviner. They identify displeased spirits of the dead and prescribe sacrifice

abanyamosira - professional sorcerers who protect against witchcraft and retaliate against witches.

Ibiriri – common term for evil spirits

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ABSTRACT

Introduction: Traditional herbal medicine plays a significant role in the health structures of many communities. World Health Organization estimates suggest that nearly 80% of African communities used herbal drugs in 2008. Many prescription medications originated as herbal remedies, however lack of standardized dosage, unexpected side effects and complications are a key set back to their use as is their contribution to delays in seeking modern health services for life-threatening conditions. Clinicians in settings where traditional therapies are widely used need to gain better understanding of the prevalence and pattern of dual use of traditional and modern approaches to health care.

Objective: The purpose of this study was to determine the prevalence and pattern of traditional herbal medicine use among children aged 0-12years admitted to Kisii Level 5 Hospital, and the factors associated with the use of these herbs.

Design: This was a hospital-based cross-sectional survey.

Data Analysis: Data obtained was coded and entered in preformed Excel data sheet and analyzed using Statistical Package for Social Sciences version 17.0. The data has been presented as numbers, percentages, medians and ranges, and in the form of tables, pie chart as appropriate. Chi-square was performed on discrete variables to test for associations. Tests of associations were done using a significance level of 0.05.

Study Utility: There is increasing need to address concerns arising from the use of traditional herbal medicines in many communities in this country with deeply embedded cultural practices. This study seeks to set a baseline by establishing the prevalence, and will provide a platform from which more analytical studies can be carried out.

Methods: Caregivers of children admitted into Kisii level 5 hospital were invited to participate in the survey on use of herbal remedies. After obtaining informed consent, care-takers were interviewed to determine their socio-demographic characteristics and patterns of herbal therapy utilization in the current illness. In addition, key informant

interviews with health workers and focus group discussions with herbalist groups were carried out to supplement the survey data.

Results: Of the 260 children recruited into the study, 162 (62.3%) had used or continued to get herbs for the current illness. Of these, 58 (35.8%) had received more than one dose of the herbs. Some of the health workers believed that certain illnesses could only be treated by herbal remedies. The herbalists believed they formed an important part of child health care structures within the community stating that certain illnesses could only be treated by them. A significant factor associated with traditional herb use was the cost of service.

Conclusion: Nearly two out of every three children admitted at Kisii Level 5 Hospital are on herbal therapy. Important factor that influence choice of herbs among these communities is the cost. The use of herbs is encouraged by a section of healthcare workers who hold the belief that certain illnesses only have herbal remedies. Herbalists have the potential to offer important screening and timely referral of sick children in these communities.

Recommendations: The role of herbalists in the care of sick children needs further evaluation to determine patient outcomes.

1. Literature Review

1.1 Introduction: Definitions and Context

Traditional medicine refers to knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures that are used to maintain health as well as to prevent, diagnose, or treat physical and mental illnesses. When adopted by populations outside the indigenous culture, traditional medicine is termed alternative or complementary medicine[1]. Herbal medication refers to any remedy of plant origin that does not meet conventional pharmacological standards and is used for the purposes of treating illnesses or improving health. According to the WHO, traditional medicines are generally categorized into two groups: medication therapies, under which herbal drugs fall, as well as use of animal parts and minerals; and non-medication therapies which include acupuncture, manual therapies like massage, and spiritual therapies[1]. Herbal medicines are the most popular form of traditional medicine used, and are highly lucrative in the international market. Annual revenues in Western Europe reached US$ 5 billion in 2003-2004. In China, sales of products totaled US$ 14 billion in 2005. Herbal medicine revenue in Brazil was US$ 160 million in 2007[1].

Regulation of traditional medicine practice

There are significant challenges associated with attempts to integrate traditional medicine into mainstream health care, ranging from policy and regulatory challenges, to safety, efficacy and quality issues as well as problems with access and concerns about rational use of these therapies. Because, in most settings, traditional medicine is not integrated into national health care systems, there is often lack of official recognition of providers and as a result few legal mechanisms to act as a check on the system. Additionally, there is no supervision to ensure adequate allocation of resources or distribution of products, and frequently there is no formal training or capacity building[1]. Safety and efficacy is not ensured, as there are no international standards for ensuring quality control of the products, and a very small evidence base for use of the therapies.

WHO position

The WHO has defined 3 health systems to describe the degree to which traditional medicine is an officially recognized element of healthcare.

In an **integral** system, traditional medicine is incorporated into all levels of care. Providers and products are controlled by strict registration and regulation. China, Korea and Vietnam have adopted this system. An **inclusive** system recognizes traditional medicine but has not fully integrated it into the health care system (Kenya, Nigeria), while a **tolerant** system is based purely on allopathic medicine but some traditional medicine practices are permitted by law[1].

The WHO attempts to regulate traditional medicine use by carrying out multiple functions. Assistance is provided to member states to help develop their own national policies on traditional medicines in order to integrate traditional medicine into national health care systems. There are WHO guidelines for traditional medicine use which provide international standards, technical guidelines and methodologies for research into traditional medicine and products, and for use during manufacture of these products. Support is provided for clinical research projects on the safety and efficacy of traditional medicine, particularly with reference to diseases such as malaria and HIV/AIDS, in order to stimulate research and promote evidence-based use of traditional medicines. Finally, the WHO acts as a clearing-house to facilitate information exchange on traditional medicine[1].

Policy on traditional medicine in the Kenyan Context

Kenya started to incorporate traditional medicine into the national health policy framework as early as the 1970's, after recognition that traditional birth attendants deliver a significant number of babies born at home in some regions of the country. The Kenya Development Plan 1989-1993 formally recognized traditional medicine and initiated registration of traditional medicine practitioners. In 1999, patent laws were revised to include protection for traditional medicines[1]. The Kenya Medical Research Institute has a centre devoted to the study of traditional medicines and has been able to identify a number of active ingredients that could be taken forward to production.

At present, every district in Kenya has a cultural officer who is responsible for control, registration and regulation of traditional herbal practitioners under the ministry of social services. This recognition aims at streamlining herbalists' practice to become an integral part of the health care system. Africa, and Kenya in particular, marks the African Traditional Herbal Medicine day on 31st August each year. The conference in the year 2010 drew nearly 50 herbal practitioners from across South Nyanza, led by the national chairman of herbalists' association. Among the issues discussed was the need to eliminate unlicensed practitioners.

1.2 Herbs as a source of modern medicines

Herbs are a known source of many conventional drugs: current antimalarial drugs have been developed from trees that have been used for over 2000 years as traditional herbs in China. Quinine is derived from *Cinchona sp*, digitoxin from *Digitalis purpuree*, vincristine from *Catharanthus roseus*, atropine from *Atropa balladona* and codeine and morphine from *Papaver somniferum*[2]. As with conventional medication, there are significant toxicities associated with herbal drugs. Examples of common side effects include diarrhoea, vomiting, renal or hepatic damage, poor nutrient absorption, skin changes, and effects on absorption of concomitant medications, among many other system-specific adverse effects. Characterizing the active ingredient responsible for the toxicity is particularly challenging, as it requires accurate identification of the plant and isolation of the active ingredients. This becomes complex, because medicinal plant properties are influenced by the time of plant collection and area of plant origin. In addition, a single medicinal plant can contain hundreds of natural constituents, and establishing which is responsible for medicinal effects and which for toxicities can be expensive and technically challenging.

1.3 Epidemiology of herbal medicine use

Widespread use of herbal medicine is of public health importance in many health systems and economies. Questions regarding herbal use revolve around safety, efficacy, quality, availability, preservation and potential for further development of this type of health care[3]. In China, traditional medicine accounts for around 40% of all health care delivered[3]. In india Ayuverdic

practitioners carry on alongside modern medical practice. Reliable prevalence data for Kenya are lacking, but estimates by the WHO suggest that in Africa in general up to 80% of the population uses herbal medicines to help meet their health care needs[3].

In a study conducted in Durban and Kwa-Zulu Natal, Threethambal Puckree et al found that 70% of patients chose to consult traditional healers first when ill and that herbalists were consulted more frequently than other types of traditional medicine practitioners, with herbalists having high case loads of up to 20 patients per day[4]. There are no region-specific data for prevalence of exposure to herbal medicine in Kenya, but observations by residents participating in the Community Child Health Elective Program (CCHEP) as well as by staff working in the pediatric ward at Kisii Level 5 hospital have revealed that a very high proportion of admitted patients have been prescribed herbal medications prior to arrival to the health facility. Some of the patients continue to receive herbal medicines while in the ward.

Herbalists are more readily accessed by the population compared to other health workers. It is estimated that the ratio of traditional healers to population in Kenya is around 1:200, a stark difference from the ratio of medical doctors to population, which is approximately 1:7000[5]. The cost of treatment by the herbalist averages USDs 1-2 while the cost of conventional medicine is often significantly higher[6]. Herbalists can be paid in kind while modern doctors require cash payments.

1.4 Factors associated with herb use

Several studies have been conducted throughout Africa to investigate health-seeking behaviors of patients and the impact of cultural beliefs on access to care, but few examine the relationship between alternative providers at the community level and conventional health care facilities and differences between alternative and conventional treatments.

(a) Perceived cause of illness as determinant of health seeking behaviour

Patients' conceptions of illness often differ from the physiologic explanations offered by conventional medical providers, as particular illnesses are believed to be of supernatural origin, and therefore can only be treated by the herbalist. Communities tend to have a relatively clear

distinction between conditions treated by traditional healers and those amenable to modern medicine. A distinction is also made regarding traditional medicines that treat ailments and those for maintaining good health.

Among the the *Abagusii* people, the community in which this study was carried out, the predominant religion is christianity but many traditional beliefs continue to influence the lives of the Gusii, particularly in the setting of disease. Ancestral spirits are often blamed for disease, death of people and livestock, and destruction of crops. There is recognized specialization among the traditional healers. There are the *abanyamoriogi* (herbalists) and *ababari* (indigenous surgeons) who set fractures and treat backaches and headaches with needles playing the primary roles in treatment of illness. The latter are famous for being able to carry out craniotomies in a completely traditional setting. Other providers are the *abaragori* (diviner) who identify displeased spirits of the dead and prescribe sacrifice, and *abanyamosira* (professional sorcerers) who protect against witchcraft and retaliate against witches[7].

A study by Tindimwebwa G. Dambisya in South Africa revealed that 26% of the subjects interviewed used herbs to treat "playte", a generic term generally used to mean ill health[8]. Illnesses treated with herbal medications tend to fall into one of two categories: illnesses more commonly recognized in conventional health facilities and defined physiologically by conventional medicine, such as malaria, diarrhea, many skin conditions and epilepsy, and spiritual/cultural ailments which are less commonly recognized by conventional practitioners, such as *ibiriri* or *bad eyes* in the *Abagusii* culture, or *playte* in South Africa. While both types frequently have overlapping symptoms, the cultural and physiologic explanations of the disease process often differ significantly.

(b) Financial implications: Affordability of Medical Care

The cost of seeking herbal treatment is often significantly less than seeking health facility treatment. Payment to herbalists can be flexible in that non-monetary terms are accepted, and systems of credit are often available. As a result, traditional herbs are at times the only affordable source of health care for the world's poorest patients. In Ghana, Kenya and Mali,

research has shown that a course of pyrimethamine/sulfadoxine antimalarials can cost several dollars, yet per capita out-of-pocket health expenditure in Ghana and Kenya amounts to only around US$ 6 per year. Conversely, herbal medicines for treating malaria are considerably cheaper, usually less than one dollar, and may sometimes even be paid for in kind and/or according to the "wealth" of the client[6].

(c)Accessibility in developing countries

In developing countries, broad use of herbal medicine is often attributable to its accessibility and affordability. In Uganda, for instance, the ratio of traditional herbal practitioners to population is between 1:200 and 1:400. This contrasts with the availability of allopathic practitioners, for which the ratio is typically 1:20 000 or less. Moreover, distribution of such personnel may be uneven, with most being found in cities or other urban areas, and therefore difficult for rural populations to access[6].

(d)Conflict between traditional and moden methods of treatment

Random surveys carried out by resident doctors in the fifth cycle of CCHEP show that many parents are reluctant to seek conventional treatment after being warned that mixing conventional and traditional medicines would harm the children. Such caregivers chose to remain with the traditional medicine practitioners. Targeted interviews with caregivers of hospitalized children in ward 8 revealed a common belief that use of conventional medicine concurrently with herbal drugs would either harm the patient or render the herbal medicine less potent.

A clear illustration of these principals is a study in the Tanga District of Tanzania looking at treatment seeking behaviour of caregivers of children with malaria which showed that up to 42% of patients sampled sought treatment from traditional healers if the child had convulsions, believing it was a spiritual condition[9]. In Kenya, a study carried out in Kilifi examined characteristics of epilepsy treatment providers and their impact on patients' treatment-seeking behaviours found that there was a preference for traditional healers over conventional medical facilities. The key reasons for preferring traditional healers were[10]

- explanations of causation and treatment were offered more regularly by healers and were usually consistent with local ideas about illness.
- communication was felt to be significantly better from traditional healers and interactions were participatory, compared with limited communication and strained interactions with providers at health facilities.
- integral role of the traditional healer in the community life was noted as a benefit
- convenient location within the community.
- flexible payment structures compared to the rigid payment at the health facility, and
- referrals to more experienced traditional healers when unable to treat were better understood by patients than referrals from hospital to hospital.

2. Study Justification and Rationale

Herbal medicine use is common among many communities in the world. Random surveys conducted during cycle 5 of the Community Child Health Elective revealed that many caregivers in Kisii visit a herbalist for nearly any illness before considering the health facility even in severely ill patients. In the Kisii region, there are no studies delineating the prevalence and patterns of herbal medicine use. Results of this study will provide baseline prevalence of herbal drug use among children admitted to ward 8 of Kisii level 5 hospital in an attempt to characterize the impact of herbal medicines on the outcome of childhood illness and serve as a platform from which future, more quantitative, studies can be conducted.

3. Study Objectives

The primary objective of this study was to determine the prevalence and pattern of traditional herb use among children aged 0 to 12 years admitted to ward 8 of Kisii level 5 hospital. The secondary objective of the study was to determine what factors are associated with herbal medicine use.

4. Materials and Methods:

4.1. Study design

This was a hospital-based cross-sectional study with a qualitative community component that comprised of focus group discussions with identified herbalist groups in Mosocho Division of Kisii Central District, and in-depth interviews with key informants in the paediatric ward.

4.2 Study setting

The study was conducted in ward 8 (the paediatric ward) of Kisii Level 5 Hospital.

Kisii Level 5 hospital is located in Kisii town in Nyanza Province. The larger Kisii region originally had 3 districts, with an estimated population of 1 million. The region was recently divided into 9 districts for improved administration. Kisii Central district, within which the hospital lies, has a population of approximately 400,000 people[11]. The population served by Kisii level 5 hospital relies on small scale farming as the primary economic activity, cultivating food crops such as maize, beans, pea, vegetables as well as cash crops like tea, coffee, bananas and sugarcane.

The hospital recently underwent constructions that include an ultramodern accident and emergency unit, outpatient department and maternity units, and since 2008 has served as the main referral hospital in the South Nyanza region. The hospital handles up to 20,000 visits to outpatient monthly of which a third are children. The children are from the immediate catchments of the Kisii level 5 hospital and the neighbouring Homabay and Migori districts. Ward 8, the paediatric ward, has a capacity of 40 but the bed occupancy frequently exceeds this. Paediatric admissions have increased steadily 350 per month in 2010 up from 250 per month in 2009. The most frequent diagnosis at admission are respiratory infections, malaria, diarrhoeal diseases, malnutrition, HIV and related complications, and sickle cell disease. Currently there are 500 to 600 deliveries per month. Approximately 10 percent of mothers attending the ANC are diagnosed with HIV every month, and PMTCT services are duly instituted. Out of over 500 children enrolled in the program in 2009 and 2010, 78 tested PCR positive (rates of 15%). The reasons for this high figure are many, but include poor compliance

to preventive measures due to stigma, cultural beliefs, rampant early weaning and mixed feeding in the first 6 months of life. Mixed feeding includes the use of traditional herbal medicines administered to infants under 6 months of age.

4.3 Study population

The study population was children aged 0-12 years and below who are admitted to the paediatric ward of Kisii Level 5 hospital.

Inclusion criteria

- Children aged 0-12 years admitted to Ward 8 of Kisii Level 5 hospital.
- Consent given by parents/guardian/caretaker.
- Willingness of parent/guardian/caretaker to take part in the study by answering the questions.
- For the qualitative arm of the study, focus group discussions were conducted with the herbalists; and in-depth interviews with key informants from among the staff members of ward 8.

Exclusion criteria

- Refusal to consent
- Caretaker not present.

4.4 Sampling method

Subjects were recruited consecutively, where any subject meeting the inclusion criteria was recruited as they came into the ward until the sample size was reached. Focus group discussions were held with identified willing herbalist groups, and in-depth interviews conducted with key informants from among the staff members of ward 8.

4.5 Study procedure

The principal investigator is a resident in Paediatrics and Child Health at the University of Nairobi and has gone through the Community Child Health Elective Program for the stipulated

eight weeks. The PI recruited a research assistant, based at the hospital and who is also fluent in the local Gusii language. The research assistant was taken through 1 week of training and understanding the questionnaire. In the second week, the PI and the assistant jointly tested the tool on patient after consent was given. The research assistant then visited the peadiatric ward of Kisii Level 5 Hospital, daily between the November 2010 and February 2011 to interview caretakers of the admitted children. The PI visited the study site every 2-3 weeks to oversee the process of data collection. For every respondent, the process and purpose of the study was clearly explained, and a written informed consent was sought from those caregivers who were willing to be a part of the study. Those enrolled were then allocated a study number that was listed on the questionnaire. The questionnaire had a section on the socio-demographic aspects of both child and caretaker. Information that was in the file including medical data of the child was recorded. Upon completion of the questionnaire, the available data was entered in a preformed excel sheet, and later analyzed using SPSS version 17.0.

For the qualitative arm of the study, interviews were held with key informants in the paediatric ward. These included a peadiatrician, a medical officer, a clinical officer and the head nurse.

In addition, there were focus group discussions with identified herbalist groups in Mosocho division of Kisii Central District. The discussion with the key informants involved getting their opinions and experiences in the ward as they took care of sick children, in relation to herbal medicine practices. These conversations were taped with the permission of those involved, and were conducted by the PI. For the focus group discussion, a meeting with herbalist groups was arranged. The key people among the herbalists had been identified earlier during the community elective. One group had 7 herbalists, and the other 16, all from Mosocho Division of Kisii Cental District. At the meeting with each group, the nature of the study was explained, verbal consent received from the key herbalist after consultation with the members. The discussion involved assessment of knowledge and practices, as well as attitudes concerning allopathic health facilities. The conversations were conducted by the PI, assisted by the hospital social worker for occasional interpretation. A recorder was used to tape the conversation, and notes taken on a field note book. At the end of the session, each group was thanked for their time.

4.6 Case definitions

In this study, prevalence of herbal medicine was defined by a simple response of use of traditional herbal medicines dating back to within 1 month of onset of current illness. This information was based on a yes-or-no response as reported by the caregiver.

The pattern in this study described the practices of the care-providers in seeking treatment for the sick child. Such practices involved, for example, observing the child at home for a few days to see if the illness would resolve, visiting the herbalist in case the illness persisted, reconsulting the herbalist if the therapy failed or deciding to go to the hospital.

Factors influencing use of herbal medicines were explored, including socioeconomic status, caregiver education level, type of illness, distance of home from health care facility, how well the explanation of the illness was understood by the caregiver and prior experience with the provider.

4.7 Sample size

Studies have been done to explore various aspects of herbal medicine use including attitudes and practices of caregivers and herbalists, use of herbal remedies for specific illnesses like malaria and epilepsy that in some cultural settings were believed to have supernatural causes. Of the prevalence studies, the one that was closest and most relevant was by WHO in 2008 which estimated that 80% of African communities relied on herbal remedies to take care of the various aspects of their health needs. This proportion was used in determining the sample size, using Fishers' formula, thus:-

$$n = \frac{(Z1 - \alpha/2))^2 \times p \times (1-P)}{d^2}$$

n= Minimum sample size

z= Degree of precision. We used a value of ±5%

P= Prevalence of herbal medicine use[1]

d= significance level set at 5%

Z1 - α /2= 1.96, is the table value for standard normal distribution curve at a significance level of 5%. Therefore,

$n = ((1.96)^2 \times 0.8 \times 0.2)/ (0.05)^2$

n = 246

A total of 260 caregivers were interviewed.

4.8 Ethical consideration

1. The study was conducted after getting approval from the Research and Ethics Committee of Kenyatta National Hospital, the University of Nairobi as well as Kisii Level 5 Hospital.
2. The child's treatment and ward care were not affected in any way by the study and there were no additional costs for participation in the study.

4.9 Study limitations

Self-reported data is susceptible to recall and reporting biases, particularly in the setting of concern that people may not be entirely honest about their use of herbal medication due to concern about criticism by hospital staff or concern that the medications won't work once use is revealed. To reduce recall bias, the duration of use of herbal medicine was limited to only one month prior to present illness. Caregivers of admitted children tend to have better recall of the treatment history due to the serious nature of such illnesses that require admission, so the study was limited to inpatients only. Under-reporting or distorting information may arise from such a study in case the caregiver feels guilty about use of herbs leading to delayed care for the sick child.

4.10 Data analysis and management

Data obtained was coded and entered in preformed Excel data sheet and analyzed using Statistical Package for Social Sciences version 17.0. The data has been presented as numbers, percentages, medians and ranges, and in the form of a pie chart, tables as appropriate. Chi-

square was performed on discrete variables to test for associations. Tests of associations were done using a significance level of 0.05.

Univariate analyses were carried out to show frequencies, and bivariate analyses were conducted for associations of herbal medicine use. Inferential statistics was done to test for strength of association.

The variables assessed were in two categories:

- Category 1: Dependent variables – outcome, that is, prevalence of herb use.
- Category 2: Independent variables which included gender, age, marital status, level of education, caregiver relationship to the child, type of employment, family income, cost of service, distance to the herbalist.

5. RESULTS

5.1 Demographic Characteristics of the study population

A total of 260 children admitted to Kisii Level 5 Hospital Ward 8 were sampled.

Nearly half of the children sampled were between the ages of 1-5 years, 124 out 260 (47.7%), median age of 2 years. There were more boys (141, 54.2%) compared with girls (119, 45.8%), giving a male to female ratio of 1:0.8. Among the 6-12 year-old children sampled, majority (15.1%) were girls compared to boys (10.0%) – Table 1 below

Most of the children admitted were accompanied by their mothers as the caregiver (218, 83.3%). Fathers accompanied 4.2% of the children interviewed and grandparents 5.4%. The other caregivers who accompanied the admitted children were aunts and uncles, older siblings, neighbours and friends of the family (Table 1 below)

Most of the caregivers were aged between 20-30 years (63.6%), married (83.8%), had received only primary level of education (50%) and were not in formal employment (70.4%).. Table 1 below.

Table 1: Socio-demographic characteristics of the study population.

Demographic characteristics of the child					
			Male(N=141)	Female(N=119)	Total(N=260)
Gender			54.2%	45.8%	100%
age of the child	0-1		41.8%	37.8%	40.0%
	1-5		48.2%	47.1%	47.7%
	6-12		10.0%	15.1%	12.3%
Demographic characteristics of the care giver					
		Married (N=222)	Single (N=32)	Widowed (N=6)	Total (N=260)
Marital Status		85.40%	12.30%	2.30%	100%
Relationship to the child	Mother	85.1%	81.3%	50.0%	83.8%
	Father	4.5%	3.1%	.0%	4.2%

Table 1 (continued)..

		Married (N=222)	Single (N=32)	Widowed (N=6)	Total (N=260)
Relationship to the child (continued)	Grand parent	5.4%	.0%	50.0%	5.8%
	Aunt	3.6%	3.1%	.0%	3.5%
	Other	1.4%	12.5%	.0%	2.7%
Age of the care giver	under 20	7.4%	44.8%	.0%	11.9%
	20-30	65.3%	51.7%	60.0%	63.6%
	30 40	19.8%	3.4%	20.0%	17.8%
	above 40	7.4%	.0%	20.0%	8.8%
Highest level of school you attended	Non formal	1.4%	.0%	.0%	1.2%
	Primary	48.4%	54.8%	83.3%	50.0%
	Secondary	38.4%	35.5%	.0%	37.1%
	post secondary	9.1%	9.7%	.0%	9.0%
	no education	2.7%	.0%	16.7%	2.7%
Formal employment of parents or not	both employed	2.3%	.0%	.0%	1.9%
	father employed	26.6%	6.3%	.0%	23.5%
	Mother employed	3.2%	12.5%	.0%	4.2%
	Unemployed	68.0%	81.3%	100.0%	70.4%

5.2 Clinical characteristic of children enrolled into the study

Respiratory tract infections remained the leading cause of admissions among children sampled (63, 24.2%). The diseases that comprised top five causes of admission included gastroenteritis, malaria, malnutrition and meningitis. The other illnesses included lymphoma/leukemias, HIV and co-morbidities, urinary tract infections and nephrotic syndrome.

Most of the sampled children had been ill for a duration of under two weeks (224, 86.2%), during which caregivers consulted herbalists, gave herbal therapies or simply waited in the hope the illness would resolve. Most of the children with reported duration of illness greater than 2 weeks had chronic illnesses: Malnutrition, HIV and co-morbidities and Sickle Cell Anaemia (Table 2 below)

Table 2: Clinical characteristics of the participating children

	Frequency	%
Admission diagnosis		
Malaria	54	20.8%
Respiratory Infections	63	24.2%
Malnutrition	12	4.6%
Meningitis	12	4.6%
Gastroenteritis	50	19.2%
Sicke Cell Anemia	10	3.8%
Neonatal sepsis	9	3.5%
Others	50	19.2%
Duration of illness		
Under two weeks	224	86.2%
2-4 weeks	26	10.0%
Over 4 weeks	10	3.7%

5.3 Herbal Medicine use

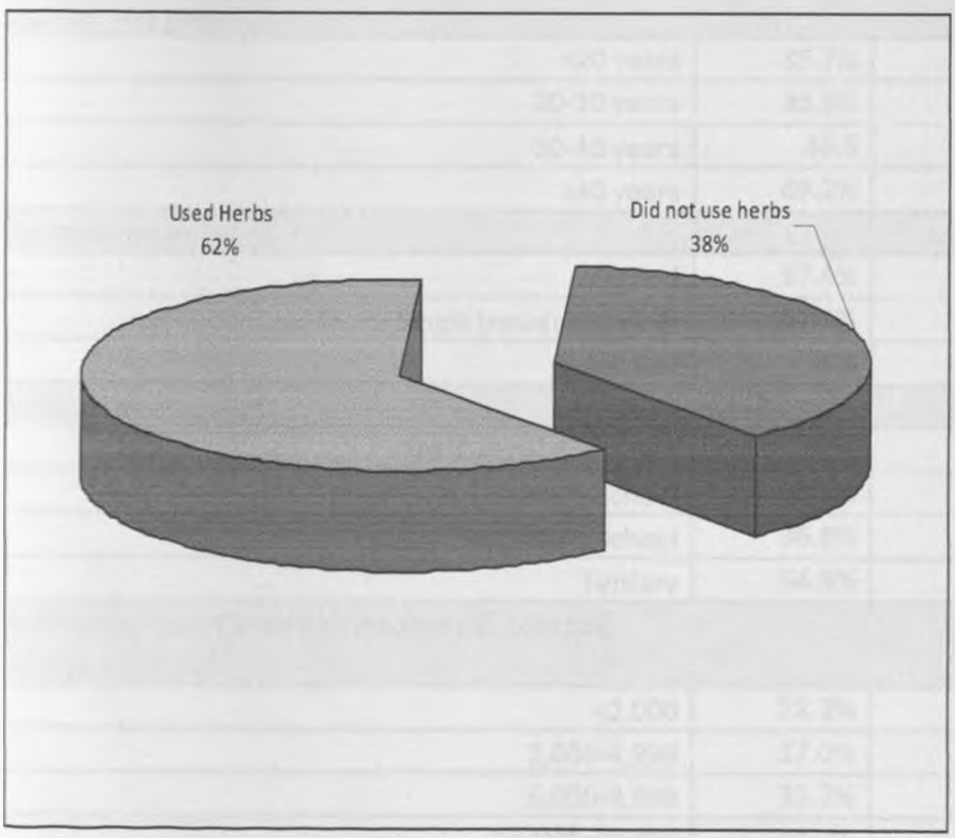
Among the 260 children included in this study 162 (62.3%) used herbs before or during their stay in the hospital for the present illness, that is nearly two thirds of children admitted to Kisii Level 5 hospital had history of exposure to herbal therapies in the month preceding the study as shown in table 3, and the pie chart below **(95% Confidence Interval for 62.3% (53.79%,70.6%)**. Of these 162 children who reported herbal use, 104 (64.2% had used them once, 39 (24.1%) twice and 19 (11.7%) three or more times as shown in table 3 below. Out of the children who

had used herbs, slightly over one third had received at least two doses of herbs for the present illness.

Table 3: Herbal Medicine use

Prevalence				Frequency N=162		
	No.	%		One dose for current illness	104	64.2%
Used Herbs	**162**	**62.3**		Two doses	39	24.1%
Did Not use herbs	**98**	**37.7**		More than 2 doses	19	11.7%

Pie Chart 1: Prevalence of herbal therapy use among children admitted at Kisii Level 5 Hospital



5.4 Relationship between herbal use and selected characteristics of the caregiver

Socio-demographic characteristics of care providers of children exposed to herbal therapy were compared to those who reported no exposure.

Age of the caregiver, marital status, level of education, amount of family income, type of house and distance to the herbalist/health facility were not significant in the relationship with herbal medicine use (p value > 0.05).

The grandparents were more likely to take the child to a herbalist compared to other caregivers (p value = 0.029). These findings are shown on table 4 below.

Table 4: Relationship between herb use and sociodemographic characteristics of caregivers

	Herbal use		
	No (N=98)	Yes(N=162)	P value
Age of care giver			
<20 years	35.7%	64.3%	Ref
20-30 years	33.3%	66.7%	0.807
30-40 years	40.5	59.5%	0.689
>40 years	69.2%	30.8%	0.52
Marital status			
Married	37.4%	62.6%	Ref
Single (never married)	37.5%	62.5%	0.99
Widowed	50%	50%	0.534
Education			
No Formal Education	50%	50%	Ref
Primary school	38.3%	61.7%	0.344
Secondary school	36.8%	63.2%	0.322
Tertiary	34.8%	65.2%	0.31
Estimated family monthly income (all sources) (Kenyan shilling)			
<2,000	22.2%	77.8%	Ref
2,000-4,999	37.0%	63.0%	0.382
5,000-9,999	35.2%	64.8%	0.444
10,000-20,000	41.3%	58.7%	0.285
>20,000	55.6%	44.4%	0.158

Table 4 (continued...)

	Herbal Use		P value
	No (N=98)	Yes(N=162)	
Type of house			
Permanent	40.5%	59.5%	Ref
Semi-permanent	38.4%	61.6%	0.801
Temporary	33.3%	66.7%	0.583
How long it takes from the nearest health center			
<15 min	37.5%	62.5%	Ref
15-30 min	32.6%	67.4%	0.586
30-60 min	42.6%	57.4%	0.608
1-2 hrs	38.2%	61.8%	0.946
>2 hrs	100%	0.0	0.999
How long it takes from the nearest herbalist			
<15 min	29.4%	70.6%	Ref
15-30 min	32.3%	67.7%	0.762
30-60 min	37.5%	62.5%	0.632
1-2 hrs	35.0%	65.0%	0.621
>2 hrs	25.0%	75.0%	0.849
Care giver relationship with the herbalist			
self	14.3%	85.7%	Ref
parent	50.0%	50.0%	0.067
grand parent	39.1%	60.9%	***0.029***
extended family	34.5%	65.5%	0.059
neighbor	26.8%	73.2%	2.04

5.5 Factors affecting herbal medicine use.

Logistic regression was carried out to look at the relationship between different variables and herbal use. This was done on factors that were found to be significant after the Chi-square testing, and which included prior experience with caregiver, relationship between caregiver and herbalist, the cost of service, and how well the explanation of illness was understood by the caregiver. The cost of service was significantly associated with herbal medicine use (**p value = 0.05**).

The other factors were statistically not significant. These findings are expressed in Table 5 below.

Table 5: Factors affecting herbal medicine use

Variable	Herbal use		P value
	No (N=98)	Yes (N=162)	
Cost of service (in Kenya shillings)			
No	40.1%	59.9%	0.05
Yes	23.8%	76.2%	
Flexibility of payment			
No	39.6%	60.4%	0.12
Yes	25.7%	74.3%	
Distance from my house			
No	37.4%	62.6%	0.326
Yes	66.7%	33.3%	
How well I understand the provider's explanation of my child's			
No	100%	0%	0.999
Yes	36.5%	63.5%	
Which symptoms or illness the child has			
No	100%	0%	0.999
Yes	36.5%	63.5%	
Prior experience			
No	88.9%	11.1%	0.13
Yes	35.9%	64.1%	
Language spoken			
No	38.0%	62.0%	0.599
Yes	25%	75%	
Whether tests are available			
No	100%	0%	0.99
Yes	37.4%	62.6%	

5.6 Key Informant Interviews

Interviews were conducted with key persons in the Paediatric Ward ofKisii Level 5 Hospital, and they included a Paediatrician, a Medical officer, a Clinical officer and the Nursing Officer in charge of the ward. The Paediatrician is a recent graduate from the University of Nairobi, and has served as the hospital paediatrician for 2 years. The medical officer had worked at the hospital for a total of 3 years; one year of internship and 2 years post internship. The clinical officer had worked for several months after clearing internship at the same hospital. The Nursing officer was experienced, having worked for at least 10 years as in-charge of the children's ward.

The Paediatrician expressed concern about the effects of herbs on very sick children *"My concern about these herbs is their effect on severely malnourished children whose parents take very long at home before presenting to hospital. When they are finally brought, they are very sick, and mortality is very high within the first 48 hours. The reason most parents give is that they were completing the herbal medicine dosages."*

The medical officer raised issues with the high prevalence of traditional herb use. *"In this community, herbal use is a way of life. Almost everyone takes herbs when sick or just to keep illnesses away. A lot of children have been exposed to herbs before coming to hospital".*

The clinical officer believed in herbal therapies, revealing that he had himself used herbs for many ailments as a child and a grown-up. He believed certain illnesses only had herbal therapies. *"You see, herbs are not bad the way many people believe. In treating ibiriri for example, one cannot use conventional medicines. You have to use herbs"* The clinical officer belonged to the Gusii community.

The nursing officer said she had adjusted well enough to understand the cultures of the people.*"I have worked here over 10 years and now I understand well the traditional beliefs and attachments to herbal therapies among the Gusii people. But many children come with herbal toxicities like severe diarroea, which is a pity since the people do not stop to administer these herbs even when we tell them not to."*

5.7 Focus Group Discussions

Focus group discussions were held with 2 groups of selected herbalists. Both herbalist groups were from Mosocho Division, and consisted of women aged between 20 and 50 years. The groups comprised 7 and 16 herbalists. The average level of education was basic primary, with only 2 herbalists having advanced to secondary school. None of the herbalists was in formal employment. Most of the herbalists had acquired their skills through apprenticeship from their herbalist grandmothers. One was widowed, the rest were married. They were all practitioners of herbal therapies, with no spiritual or other traditional components.

Mosocho Division is one of the divisions in Kisii Central District, and was recently proposed to be a district for better administration. It forms one of the core catchment areas of Kisii Level 5 Hospital, and the main economic activity of the people is farming. (See map, appendix VI). The discussions were conducted by the PI, and taped after verbal consent was given by the herbalist groups. In addition, a field note book was used to take points.

We started by establishing the knowledge, attitude and practices of the herbalists. There was poor knowledge on what constitutes a basic balanced diet, but impressively, they agreed on the the fact that newborns are supposed to largely breastfeed for 6 months, with the exception of occasional herbal therapies to maintain health. According to the herbalists, newborns are given herbs starting from age 2 weeks to take care of abdominal discomfort and also to ensure good health by keeping spirits at bay.

"A newborn, like my grandchild here, must get herbs so she can grow well without any ailments. I started giving her herbs when she was 10 days old and she breastfeeds and sleeps very well " Quoted from the host herbalist at whose home we conducted the focus group meeting for one of the groups. Her grand daughter was just a few weeks old, having been delivered at home.

Many of them believed that most illnesses were caused by evil spirits, and that diet, or the lack of it, played very little role in illnesses in children.

"When this child came to my home, she was white on her palms and eyes, and her body was swollen, I then knew immediately the child will need blood so I referred her to hospital. I expect

that they will come back after the blood is given" This was one herbalist reporting her recent experience when she referred a child with severe malnutrition and anemia to hospital before instituting herbal therapies. We commended her for the referral.

"I wish the hospital doctors would be willing to work with us, and send us children they cannot treat so that we help them" One herbalist expressing frustration at the lack of co-operation from conventional practitioners.

They all felt the allopathic practitioners should recognize the good work they do of taking care of sick children in the community. They showed willingness to work with healthcare workers to improve the care of children, and did not see hospitals as a competition to their trade. The urged to be empowered with basic knowledge so they could do their work better.

The herbalist groups affirmed that certain illnesses like *ibiriri* (evil eye) and oral thrush could only be treated by them, and that allopathic care for such children who were already on herbal medicines would complicate their conditions, leading to death.

*"These scientific doctors think they can treat all types of illnesses but that is absolutely untrue. They cannot treat illnesses like ibiriri and oral thrush that require an understanding of supernatural spirit"*reported one herbalist emphasizing their role in the care of sick children.

6. DISCUSSION

This study shows that many children served by Kisii Level 5 Hospital are subjected to traditional herbal medicines to take care of various health needs. The main reason for this is due to deeply rooted cultural beliefs, that herbal remedies sort out all childhood illnesses, in addition to maintaining good health. The communities served by the hospital have many herbal practitioners, some with training through apprenticeship with existing herbalists, and others inspired by their fore-fathers to carry forth the trade. Such presence of so many herbalists makes it easy for caregivers to resort to herbal medicine use, moreover, the cost of herbal medicines is pushed down by the stiff competition that exists.

Many children are exposed to mutiple doses of the herbs, and this study revealed that atleast one-third of the children studied had received two doses and more for the present illness, mostly from the same herbal practitioner. Again, this emphasizes the deep cultural beliefs in herbal medicine use, so that even when a child did not improve, the caregiver still had a lot of faith in the same herbalist. Eventually the caregiver would come to the conventional facility upon being urged by the herbalist to do so, the reason being that the 'herbal-treatable' part of the illness had adequately been covered.

A study by Threethambal Puckree et al found that 70% of patients enrolled in the study in Durban and Kwa-Zulu Natal, South Africa, chose to consult traditional healers first when ill. This, according to the study, was driven by the cultural beliefs of the people[4]. In Tanga District of Tanzania, a study looking at treatment behaviour of caregivers of children with malaria showed showed that nearly half of those sampled went to the traditional healers first if the child presented with convulsions. This is because such presentation was believed to be a spiritual condition, that only traditional healers could treat[10].

Such high prevalence of use of traditional herbal medicines has many implications in the morbidity patterns, as well as mortality of sick children in this community. First of all, there is delay in getting to the hospital for proper care. As such, some illness get complicated, leading to increased duration of stay in the hospital, with direct cost implications. Secondly, the possible interactions of these herbal remedies with conventional medicines is of real concern. Though I

did not come across any specific studies outlining such interactions, it is fair to state that interactions do exist, and impact adversely on the health of the sick children. This is reinforced by the fact that a lot of the herbal medicines contain one or multiple active pharmacological ingredients, in unknown proportions.

In exploring factors associated with traditional herb use, even though Chi-square test showed a relationship with how well the provider's explanation was understood by the caregiver, prior experience with the herbalist and relationship between caregiver and herbalist,; they were not significant when logistic regression was carried out. (Table 5 above). The cost of treatment was found to be statistically significant (p value = 0.05)

The cost of herbal medication was found to be significantly cheaper than seeking treatment at the conventional hospitals. Whereas most herbalists charged an average of less than 1USD for treatment, with no added cost on investigations, most hospitals charged at least 2USDs for consultation alone, before tests and medications. Patients admitted to the wards paid much more at the end of treatment. In a study conducted by W.H.O in Ghana and Kenya, the cost of treatment for malaria was estimated at several dollars, whereas the herbal treatment was significantly cheaper, usually less than a dollar, and was often paid for in kind or according to the wealth of the individual[5].

Caregiver relationship with herbalist was found to be an important factor in influencing herbal medicine use. The grandparent was more likey to consult a herbalist or administer herbs to the sick child under their care. They are various possible reasons for this finding: the grandparent had prior experience with herbalists, leading to some form of trust in herbal therapies. Also most grandparents doubled as herbalists in their own rights, tapping from the vast experience and cultural practices of many years.

It made sense that most herbalists explained illnesses to caregivers in terms that they understood well, in keeping with their beliefs and cultural patterns, although this finding was not statistically significant. Causations of illnesses were frequently related to either bad omens, evil spirits, bad luck or simply the consequences of supernatural powers. Such explanations

were in line with the way of thinking of the caregivers and were better understood compared with those that the allopathic practitioners provided. In the hospital, explanations like poor diet causing malnutrition, or deranged liver functions leading to specific symptoms, or even tryng to analyze a full blood count picture to the caregiver din't seem to make a lot of sense. And this was irrespective of the level of education of the caregiver! There were possible confounding factors for this finding, despite supporting studies: age of the caregiver (most of them were 30 years and below).

In Kenya, a study carried out in Kilifi examined characteristics of providers of epilepsy treatment, and their impact on patients' treatment seeking behaviours. Important themes for patients' preference for traditional healers include explanation of causation and treatment being consistent with the cultural beliefs, interaction with traditional healers being more participatory, presence of the healer within the community, flexible payment structures, and good structures of referrals from herbalist to herbalist[10].

Other factors that were explored but found to have no significant statistical association with traditional herb use included distance to health facility, socioeconomic status of the family/careprovider, pegged on the income, amount of land owned, whether employed or not, and the type of house. Also, the level of education of the caregiver did not have a bearing on herbal medicine use. The reason for this is the deeply embedded cultural practices, that even formal education can not erode from among the community. Many people did not care about availability of tests, or the lack of them, as is the case with herbalists. The increased burden of tests in terms of cost for the caregiver explains this finding, given that the cost of treatment strongly influenced herbal medicine use.

The qualitative arm of the study included indepth interviews with key informants in the paediatric ward and focus group discussions with herbalist groups in Mosocho division of Kisii Central District. The clinical officer believed that certain illnesses could only be treated by herbal remedies, and confirmed that he advised patients to seek herbal treatment even if the patient was already admitted to the ward, if in his opinion the child could benefit from herbs.

This practice impacts on the morbidity, and even mortality of these children, given that there are times when the clinical officer is the only health personnel available to take care of the sick children. The Paediatrician and the medical officer noted with a lot of concern that the use of herbs resulted in delayed care for sick children, and impacted negatively on illnesses like malnutrition.

The herbalists believed there were certain illnesses only they could treat. This belief was based on cultural and social practices in the community. This practice was perpetuated by the fact that some children actually recovered coincidentally from their illnesses after use of herbs. However, more often than not, observations in the hospital revealed multiple complications from herb use.

The herbalists were keen to work with allopathic practitioners, but only if their role in the care of sick children was recognized. The use of herbal medicines in these communities is very deeply embedded, and simply telling them to stop would not work. Rather, a more integrative approach, where the herbalists are allowed some degree of screening at the community level before referral may be the way to do it. During the community work, we trained a group of herbalists on the use of Mid-Upper-Arm-Circumference (MUAC) tapes to screen for malnutrition in the community. As a follow up 2 weeks later, 6 of them had correctly identified and referred children at risk of malnutrition to the hospital before giving any herbal therapies.

7. CONCLUSION

1. Nearly two-thirds of children admitted to Kisii Level 5 Hospital have been subjected to traditional herbal therapies, with one-third of them receiving multiple doses for the same illness. The same number of patients see herbalists first before presenting to hospital.
2. Factors that influence the choice of herbs among these communities is mainly the cost. Grandparents as caregivers were more like to consult herbalists compared with other caregivers.
3. The use of herbs is encouraged by a section of healthcare workers interviewed.

8. RECOMMENDATIONS

1. The role of herbalists in the care of sick children in these communities needs to be addressed, and a more integrative approach may be the way to start.
2. In order to fully understand the outcomes and complications of traditional herbal therapies, a further more qualitative study should be carried out.

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Appendix I

Informed Consent Form

Title: A study of the prevalence and patterns of herbal medicine use among children 0-12 years admitted to ward 8 of Kisii level 5 hospital.

Investigator: Dr. Sam J.O. Oula

Supervisors: Prof. Ruth Nduati, Prof. Wasunna, Dr. Dalton Wamalwa, Prof. Elizabeth Obimbo.

Investigator note. Thank you for agreeing to read this form. It offers important information about this study which will help you make a decision on if you will be a part of the study. Appropriate translation will be carried out in a language you are most comfortable with.

Introduction: Herbal medicines play an important role in health seeking behaviours of many communities of this country. Many conventional drugs are a product of herbs. This study aims at establishing the prevalence and patterns of herbal medicine use among children admitted to Kisii level 5 hospital, and to highlight what factors determine the use of herbs.

Procedure: If you agree be part of this study, I will ask you personal questions, some of which may be sensitive, as well as questions about your health seeking practices for your sick child, including use of herbal medicines and what factors drive the demand for herbal medicines. All questions are meant for use in this study but you need not feel obliged to answer any of them that you may be uncomfortable with.

Benefits: Findings of this study will be interpreted to you, the hospital management team, the DHMT and the University of Nairobi. The findings will help establish better linkages between the community herbal medicine practitioners and the hospital so as to ensure better care for children.

Confidentiality: If you agree to be part of the study, the information will be held in strict confidence and only used for the purpose of this study.

Reassurance: The management of your child will in no way be affected by your decision to decline or participate in the study. The cost will not change in any way through this study.

Ethical consideration: I have been granted approval from Research and Ethics Committees to conduct the study. Inquiries on ethical concerns can be got from,

Prof A N Guantai,	Dr. Gitau Chege
Secretary, KNH/UON-ERC,	Secretary, KL5H ERC
Kenyatta National Hospital,	Kisii Level 5 Hospital
Hospital Rd, along Ngong Rd.	Kisii Town
P.O.Box 20723, Nairobi	P.O. Box 92, Kisii
Tel: (020) 726300-9	Tel 058 - 31310
Fax: 725272	Fax 058 - 31310

To indicate that you understand the conditions of this study and that you consent to participate in it, please sign or put your thumbprint in the space provided below.

I ..... confirm that the study has fully been explained to me and I give consent to participate in it.

Signature/Thumb print .....

Investigators Signature .....

Date.....

Appendix II

Questionnaire

Part 1: SOCIO-DEMOGRAPHIC DATA

Code_____ Hospital No of child_____

Name_____ Sex M/F

SECTION 1: BACKGROUND

Village_____Location_____Division_____District_____Tribe_____

Contact Phone #:

I WANT TO ASK YOU A FEW QUESTIONS ABOUT YOURSELF AND YOUR HOSPITALIZED CHILD

1.	How old are you?								
2.	What is your relationship to the child?								
3.	What is your marital status?	1. Married 2. Single (never married) 3. Widowed							
4.	What is your child's name?								
5.	Date of birth of child	D	D	M	M	Y	Y	Y	Y
6.	How old is the child?								
7.	How many children do you have?								
8.	Where does this child fall in birth order?	1. First-born 2. Middle(specify:) 3. Last-born							
9.	Type of house	1. Permanent (brick/stone with iron/tiled roof) 2. Semi-permanent (mud walled with iron roof) 3. Temporary (mud walled with thatch roof)							
10.	Are the caregivers employed?	1. Yes – both 2. Father only 3. Mother only 4. Both are unemployed (skip to #13)							
11.	What type of employment? (circle all that apply)	1. Farmer 2. Service industry(hotel/matatu crew)							

		3. Professional(nurse/teacher/public health) 4. Other (specify):
12.	Amount of land owned	1. <1 acre 2. >1 acre 3. no property owned
13.	Have you (caregiver) ever been to school?	1. Yes 2. No
14.	What is the highest level of school you attended?	1. Non-formal 2. Primary 3. Secondary 4. Post-secondary 5. No education
15.	What is the name of the nearest health facility?	
16.	How far is the nearest health facility from your home?	1. By foot (minutes) 2. By motorbike (minutes)
17.	How far is the nearest herbalist from your home?	1. By foot (minutes) 2. By motorbike (minutes)
18.	Are you related to the herbalist?	1. Yes 2. No
19.	What is your relationship with the herbalist?	1. Self 2. Parent 3. Grandparent 4. Extended family 5. Neighbour 6. Other (specify)

MEDICAL HISTORY

20. Date of admission_____
21. Admission diagnosis in the ward_____
22. Current diagnosis (if differs) _____
23. PITC/DTC status Positive ☐ Negative ☐ Unknown ☐
24. Anthropometric Data (medical records)Height(cm)_____Weight(kg)_____ Z Score(WHO)____ MUAC_____
25. Duration of illness: under2weeks___ 2-4weeks_____ Over 4 weeks____

26. **Did the child receive herbal medicine within 1 month prior to current illness? Yes___ No___**

27. If yes, for what illness: _____

28. Where did you first go for advice or treatment when the child fell ill? ***MULTIPLE RESPONSES POSSIBLE***		
Health facility/hospital/health centre clinic	1. Yes	2. No
Community health worker	1. Yes	2. No
Medicine shop	1. Yes	2. No
Friend/relative	1. Yes	2. No
Herbal medicine person	1. Yes	2. No
29. Who decided that you should go there?	1. Myself 2. Husband/partner 3. Mother-in-law 4. Friends/neighbour 5. Other (specify)	
30. How long was the child on herbal medicine prior to seeking care at the health facility?	1. 1-3 days 2. 3-7 days 3. >1 week	

31.	Are there illnesses for which you would go to the herbalist first?	1. Yes 2. No (skip to #26)
32.	For which illnesses would you seek an herbalist's care first?	
33.	Are there illnesses for which you would go to the health facility first?	1. Yes 2. No
34.	For which illnesses would you go to a health facility first?	
35.	What is the longest period of time that you would treat with herbal medication prior to switching to conventional medicine, if the child is not improving?	1. 1-3 days 2. 3-5 days 3. 5-7 days

			4. >1 week	
36.	For the following symptoms, check whether you would go to the herbalist first, to the health facility first, or undecided			
	Symptoms	Herbalist first	Health facility first	Undecided (elaborate)
	Diarrhea			
	Vomiting			
	Stomach pain			
	Difficulty in breathing			
	Hotness of body			
	convulsions			
	Pallor			
	Diaper rash			
	White tongue / oral thrush			
	Swollen feet			
	Enlarged spleen			
	Ibiriri			
	Eye problems			
	Cough			
	Inconsolable crying (infant)			
	Other (specify)			
37.	For the following diseases, check whether you would go to an herbalist first, to a health facility first, or that you are undecided.			
	Disease	Herbalist first	Health facility first	Undecided (elaborate)
	Malaria			
	Pneumonia			
	HIV			
	Tuberculosis			
	Malnutrition			
	Other (specify)			
38.	Do the following affect your decision about where to seek care for your sick child?			
	FACTOR		YES	NO	If yes, which provider do you prefer? (mark

				#1 for herbal, #2 for health care facility)
	Cost of the service			
	Flexibility of payment			
	Distance from my home			
	How well I understand the provider's explanation of my child's illness			
	Which symptoms or illness the child has			
	Prior experience with the practitioner (either good or bad)			
	Language spoken by the provider			
	Whether tests (e.g. blood) are available			
39.	Do you feel comfortable telling nurses/doctors at health care facilities that your child is on herbal medications?	1. Yes (if yes, skip question #30) 2. No		
40.	If you answered "no" to question #29, mark as many of the following as apply:	1. I will be scolded/reprimanded 2. The herbal medicine will no longer work 3. I will be told to leave the facility 4. My child will be treated poorly by the health facility staff 5. Other (please describe) _____		
41.	Do you think herbalists and conventional doctors should work together to treat your child?	1. Yes 2. No If yes, please explain how this might work: _____ _____ _____		

Final Commentary

THANK YOU FOR PARTICIPATING

Appendix III

Focus group with Herbalists

Discussion Guide

I. **Introduction**

   a. **Introduce Moderators**

   b. **Describe the project:**

      "This project asks herbalists to share their experiences in caring for sick children. We want to know more about your practice and your perceptions of the relationships among herbalists and conventional medical providers. We are also meeting with parents of children hospitalized at Kisii Level 5 hospital to learn more about how they decide when and where to seek medical care for their sick children. The information we gather will be used to understand more about providing quality care for sick children and to improve communication among herbalists and conventional medical providers."

   c. **Ground rules for discussion**

      i. Everything said here will remain confidential. The report that will be written to summarize what is said today will not contain any names or other identifying information.

      ii. Your decision to participate today is voluntary. You can decide at any time, without notice, for any reason, to not participate in the study.

      iii. We will be tape recording the discussion today to help us remember what was said.

      iv. We would like to hear from everyone present

      v. The discussion will be informal

      vi. You do not need to be an expert—just share your feelings and experiences as we discuss different topics

      vii. There are no wrong answers—everyone's opinion is important

      viii. Please think about the last several children you treated. Try to answer all questions based on those children.

II. Demographic Info (To collect after discussion in survey form from individual herbalists)

a. Age
b. Gender
c. Education Level
d. How many children do you have?
e. How far do you live from a health facility?
f. What is your title? (What kind of traditional practitioner)
g. How many years have you been in practice?
h. Are you registered with the district?
i. Are you a traditional birth attendant?
j. How were you trained?
k. Were you ever part of the conventional health care system? (chw? Nurse?)
l. How many children do you treat per week?
m. What is the average length of your patient visit?
n. Do you do home visits?
o. Do you accept alternative forms of payment?

III. **Focus Group Discussion**

a. **ICE-BREAKER** : Tell me about your role in supporting mothers to care for their children.

b. **Knowledge: Learning about Traditional Providers**

   i. What are the local terms for traditional healers?
   ii. What are the differences among these healers?
   iii. How does a person become an herbalist? Traditional healer?
   iv. How many children do you typically treat per week?

c. **Attitude:**

Herbalists' role in the community

   i. Tell me about your role in the community and how community members think about you.
   ii. Why do you think care givers bring sick children to you?

Relationships among providers

   iii. Tell me about the relationship between conventional health care practitioners and herbalists.
      1. How do you relate with conventional health care practitioners?

2. What do you see as the role of hospitals/health facilities in the treatment of sick children?

iv. What are the barriers to cooperation among herbalists and conventional practitioners?

1. What do you see as possible solutions?

v. How do you feel about working in conjunction with the health facilities to help sick children get well?

1. Under what conditions would you work with them?
2. What do conventional providers need to learn in order to work well with herbalists?
3. What do herbalists need to learn in order to work well with conventional providers?

vi. Would you be open to a joint meeting with conventional providers to share ideas about how to improve treatment for children?

1. If so, what topics would you want to talk about?

d. **Practice:**

Common Illnesses and their treatment

i. About how many children do you treat per week?

ii. What are the most common (top 5) illnesses or symptoms that you treat in children?

1. What herbs/medicines do you use to treat – local names (if it's not intrusive?)
2. Have you seen children presenting with body swelling with hair thinning and poor appetite? What is this? How do you treat? (Show picture of kwashiorkor)
3. Have you seen children who are very thin, with "old man" faces and huge appetites? What is this? How do you treat? (show picture of marasmus – appendix IV)
4. Probe: What is malnutrition? Symptoms? Signs? Causes?

iii. Please describe your approach to managing children who are malnourished.

1. Do you ever weigh or take growth measurements?
2. Have you heard of MUAC?

3. Do you give advice to mothers about nutrition? Breastfeeding? Weaning?

iv. In medicine there are times that doctors, healers, and nurses are presented by a patient with an illness that they do not treat – and they might refer the patient to another type of healer or send them home. Tell me about the conditions that you do not treat, but feel others can treat.

1. Do you refer patients to other herbalists? To health centers?
2. Which illnesses do you refer?
3. What are the signs that a child is severely ill?

This section to be discussed if/when herbalists suggest that they give advice to parents on nutrition

Malnutrition

v. What is a balanced diet?

vi. How does what a child consumes affect their risk for infection?

vii. Are there times when you tell parents to avoid feeding the child certain foods?

viii. Probe: Do certain foods contribute to illnesses? Which ones? What foods should parents avoid when children are sick?

Appendix IV

Malnutrition Pictures

Child with marasmus.

Appendix V

Questionnaire for health care workers:

Name: Position:

Location of Employment: Level of Health Facility:

Duration of service

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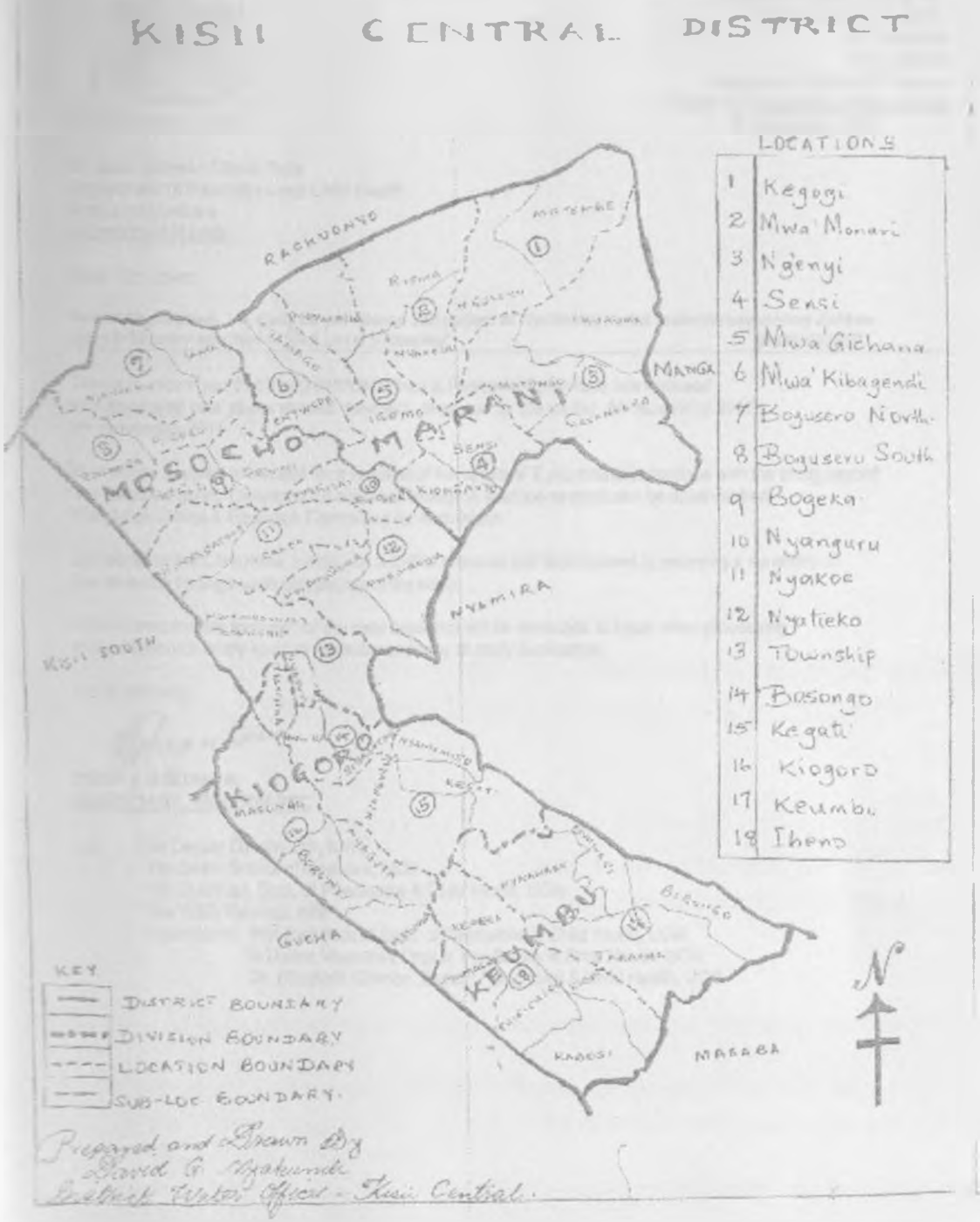
1. Who do you think should be trusted to give advice on the health of a child when (s)he is ill?
    a. (mother in law/husband/CHW/herbalist/traditional healer/witch doctor/community elder)
    b. Who should give advice regarding nutrition?
2. What do you see as the role of xx in the health care of a child?
    a. A herbalist?
    b. A traditional healer?
    c. A witch doctor?
3. In your experience (both personal and in the work setting),
    a. Do you think parents take a child to an herbalist if he/she is malnourished?
    b. What if they were throwing up or had diarrhea?
    c. Coughing?
    d. Fevers?
    e. Convulsions?
    f. Skin problems?
    g. For which illnesses do you think parents are more likely to take the child directly to the health facility?
4. When you are caring for a sick child, do you feel comfortable asking a parent if the child is taking herbal medicines? Why?
    a. Do you think the parents feel judged?
5. What do you perceive to be the benefit to the child from taking herbal medicines?
6. Do you see parents continuing to give herbal medicines in the hospital?

7. What are the benefits and problems with treatment from the herbalist? What improvements would you suggest?
8. What are the benefits and problems with treatment from the health facility? What improvements would you suggest?
9. For children you've cared for who have received herbal medicines,
    a. which treatment did the child receive?
    b. What illness or symptoms was being treated?
    c. Where was the treatment obtained?
    d. Who was dosing the child? (how many different people?)
    e. What was the prescribed dose of this herb?
    f. How many different herbs had the child received?
    g. Which doctor prescribed the herbs?
    h. For how long were they treated?

Appendix VI – Map of Kisii Central District



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Ref: KNH-ERC/ A/621

5th November 2010

Dr. Sam Johnson Otieno Oula
Department of Paediatrics and Child Health
School of Medicine
University of Nairobi

Dear Dr. Otieno

Research proposal: "A study on prevalence and pattern of Traditional Herbal medicine use among children aged 0-12 years admitted to Kisii Level 5 Hospital" (P324/09/2010)

This is to inform you that the KNH/UON-Ethics & Research Committee has reviewed and **approved** your above revised research proposal for the period 5th November 2010 - 4th November 2011.

You will be required to request for a renewal of the approval if you intend to continue with the study beyond the deadline given. Clearance for export of biological specimens must also be obtained from KNH/UON-Ethics & Research Committee for each batch.

On behalf of the Committee, I wish you a fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of the data base that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Yours sincerely

PROF A N GUANTAI
SECRETARY, KNH/UON-ERC

c.c. The Deputy Director CS, KNH
The Dean, School of Medicine, UON
The Chairman, Dept. of Paediatrics & Child Health, UON
The HOD, Records, KNH
Supervisors Prof.Ruth Nduati,Dept. of Paediatrics & Child Health, UON
Dr Dalton Wamalwa.Dept of Paediatrics & Child Health, UON
Dr Elizabeth Obimbo, Dept.of Paediatrics & Child Health, UON

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KISII LEVEL 5 HOSPITAL
P.O BOX 92
KISII

Ref: No.....

Date: 17th November, 2010

Dr. Sam Johnson Otieno Oula,

Department of Paediatrics and Child Health,

School of Medicine,

University of Nairobi

Dear Dr. Oula

Research proposer: 'A cross sectional study on prevalence and pattern of traditional herbal medicine use among children aged 0-12 years admitted to Kisii level 5 hospital'

This is to inform you that the Kisii level 5 Hospital (KL5H) Ethics and Research committee has reviewed above research proposal. It has also taken note of the approval of the same by KNH/UON Ethics and Research committee on 5th November 2010 for a period of one year.

The committee has approved the research proposal with the following recommendations;

1. **Ethnic identity in the questionnaire**-Since Kisii level 5 hospital is patronized by clients of various tribes with different cultural or traditional practices, include tribe or ethnic identity in the questionnaire.
2. **t-test on page 13**-You have stated that t-test is used to test for association rather than for significance.
3. **Ethical consideration**- Please indicates that you also sought approval from KL5H Ethics & Research committee and include the address.

The committee wishes you a fruitful study and look forward to receiving a copy of your findings upon completion of the research. This will not only help in better patient care in our hospital but it will minimize chances of research duplication when approving other related study proposals.

Yours' faithfully,

Dr. Gitau Chege

Secretary, KL5H, Ethics & Research committee.

c.c.

Head of Clinical Services, KL5H

Dean, School of Medicine

The Chairman, Dept. of Paeditrics and Child Health,UON.

KL5H Record

Supervisors: Prof Nduati, Dept. of Paeditrics and Child Health,UON.

Dr. Dalton Wamalwa, Dept. of Paeditrics and Child Health,UON.

Dr. Elizabeth Obimbo, Dept. of Paeditrics and Child Health, UON.