

MMED DISSERTATION

TITLE

**FACTORS ASSOCIATED WITH LATE PRESENTATION
TO KENYATTA NATIONAL HOSPITAL FOR ACUTE
SEVERE ILLNESS IN CHILDREN AGED 2-59 MONTHS**

**A DISSERTATION SUBMITTED IN PART FULFILLMENT
FOR THE DEGREE OF MASTERS IN MEDICINE
(PAEDIATRICS AND CHILD HEALTH) OF THE
UNIVERSITY OF NAIROBI.**

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AUGUST 2008

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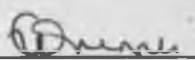
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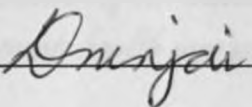
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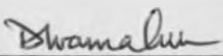
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DEDICATION

To my mother Beatrice and my father Joseph Gitau (R.I.P) who did everything they could to ensure I came this far. They put in their resources and support and prodded me on. Am greatly indebted to them

And

To all the children of our beautiful world- You need all the love together with timely and appropriate health care when your bodies are hurting. Children, you made my dream!

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ABBREVIATIONS

- ARIs - Acute respiratory tract infections
- BID - Brought In Dead
- CI - Confidence interval
- ETAT - Emergency Triage Assessment and Treatment
- IMCI - Integrated Management of Childhood Illnesses
- KEMRI - Kenya Medical Research Institute
- KSh - Kenya Shillings
- KNH - Kenyatta National Hospital
- MDGs - Millennium Development Goals
- MOH - Ministry of Health
- NHIF - National Hospital Insurance Fund
- OR - Odds Ratio
- OTC - Over the counter
- PFC - Paediatric filter Clinic
- UNICEF - United Nations Childrens' Educational Fund
- WHO - World Health Organization

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ABSTRACT

Background: Delay in seeking appropriate healthcare for ill children is an important cause of morbidity and mortality especially for those aged below five years. Many factors contribute to these delays. Understanding these factors in any particular setting is helpful to enable the concerned health worker(s) address the caretaker concerns insofar as this leads to late care seeking for illness with its subsequent implications.

Objective: To determine the factors associated with late healthcare seeking behaviour among severely ill children aged 2-59 months presenting to Kenyatta National hospital.

Design: A hospital-based case control study.

Setting: The Paediatric filter clinic and the paediatric medical wards at the Kenyatta National Hospital (KNH).

Subjects: Children aged 2- 59 months who were brought to the hospital with acute severe illness and their caretakers. A total of 316 caretakers and their ill children were enrolled into the study between November 2007 and February 2008.

Results: Of the 316 caretakers interviewed, 301 (95%) were mothers, the rest were other relatives. Among their ill children, 177 (56%) were boys, the rest were girls. The median age for the controls was 10 months, and 7 months for the cases. Symptoms of cough and diarrhoea were likely to be associated with presentation later than 3 days with OR of 2.09 (CI 1.23-3.56) and 1.57(CI 1.01-2.73) respectively. Herbal Medicine was used by 5% of the study population and was associated with marked likelihood of late presentation [OR 41.7(CI 4.70-369.1)]. On outcome, there was enhanced chance of death in the cases compared to the controls [OR 4.69 (CI 1.62-14.6)]. The median length of hospital stay was longer for the cases (7 days vs 5 days) $p=0.05$.

Conclusion: Caretakers bringing their acute severely ill children later than 3 days since illness onset to KNH are more likely to have explored other healthcare options first compared to similarly ill children brought within 3 days. These severe presentations include severe dehydration, severe respiratory distress among others. Cases had more adverse outcomes in terms of mortality and length of morbidity as reflected by the longer periods of hospitalization.

Recommendation: Education of mothers and health caregivers at the peripheral health facilities on the aspects of community IMCI will promote timely referral for ill children.

CHAPTER ONE

1.0 BACKGROUND/ LITERATURE REVIEW

Every year, almost 11 million children die before their 5th birthday, the daily death rate being 30000 children. Most of these deaths occur in developing countries. These deaths result from a disease or a combination of diseases that can be prevented or treated by existing inexpensive interventions. Sub-Saharan Africa and Southern Asia have the highest child mortality figures and progress in reversing this state of affairs has been slow.¹ In Kenya, the Under 5 mortality rate was 121/1000 live births in 2006 and shows a progressive upward trend since 1990 when the figure was 97/1000 livebirths.²

The World Health Organization (WHO) estimates that seeking prompt and appropriate care could reduce deaths due to acute respiratory infections (ARIs) by 20%.³ Of the childhood deaths in developing countries in 1993, about 27 percent resulted from ARI and another 23 percent resulted from diarrhea.⁴ The Integrated Management of Childhood Illnesses (IMCI) strategy was developed by the WHO and UNICEF in an effort to reduce the increased child mortality from these common childhood killers. Besides improving providers' skills in managing childhood illnesses, IMCI also aims to improve families' care seeking behaviour. The health workers are trained to teach the mothers about danger signs and counsel them about the need to seek care promptly if these signs occur.⁵

Alongside such strategies as IMCI, other programmes promoting community participation in matters of child welfare have been initiated. An example of this is the Bamako Initiative started in 1987 whose idea was to select a few critical elements of Primary Health care (PHC) for child survival, which would be funded partly through community contributions. In the end, the initiative did not make a significant impact on the deteriorating conditions of child welfare and was therefore abandoned.⁶ In line with the resolutions of the World Summit for Children held in 1990, many governments made a commitment to ensure the health and wellbeing of children. The governments herein resolved to implement programmes geared at among others the reduction by 50% in the deaths due to diarrhea in children under the age of 5 years and 25% reduction in the

diarrhoea incidence rate, and reduction by 1/3 in the deaths due to ARIs in children under 5 years of age.⁷

The Fourth Millennium Development Goal aims at reduction of child mortality, the target being to reduce by two thirds, the under-5 Mortality, between 1990 and 2015. Child mortality is closely linked to poverty. Advances in infant and child survival have been occurring very slowly among people in poor countries and among the poorest people in wealthier countries. Education, especially for girls and mothers, contributes in saving children's lives. Raising Incomes can also contribute in saving childrens' lives, but little can be achieved unless health services reach those who need them most.¹

Children by nature cannot seek health care on their own when they are unwell, and are dependent on a caretaker, usually the mother, to do so. The very young ones for example those below 2 months of age, are even more vulnerable as the severity of their illnesses may be underestimated by their caretakers and a good number of them die before appropriate care is sought. Where the quality of care at health facilities is adequate, prompt health care seeking has the potential to reduce mortality substantially. Appropriate care requires that a household recognizes promptly when a child is ill, decides early when an illness needs to be treated outside the home, and seeks timely and appropriate medical care.⁸

Kamat notes in a study done in a Tanzanian village that mothers were being strategic in the presentation of their child's illness, in order to authenticate it, even if it meant that they were inadvertently putting the child at risk of developing serious complications. This strategy was utilized so that the hospital staff would take the illness seriously and offer the best treatment possible. Besides the strategic illness presentation, he also observed that some mothers do avoid seeking prompt treatment for their febrile children at the local health facility because of their concern that once they have taken their child to a government health facility, he/she might be diagnosed with a more serious condition than ordinary fever, warranting extended treatment, and extra costs. These mothers were found to maximize home based treatment as a cost saving measure.⁹ Elsewhere, Nyamongo

found that patients tended to start with a cost saving measure in the form of self treatment as they evaluate the condition. He found that malaria patients tended to move progressively from self treatment with Over the Counter (OTC) drugs to the use of private or government health care facilities if the illness extended for a longer period.¹⁰

The practice of wait and see has been reported as an important phase before health care seeking. In this practice the caretakers offer home care within 24 hours of illness onset and buy time to assess before conclusively deciding that what afflicts them or those under their care requires attention outside the home.¹¹ Nyamongo et al reports that most mothers waited upto three days before taking action for malaria, diarrhoea, and ARI related conditions while they tended to wait longer for conditions such as tuberculosis, yellow fever and malnutrition.¹⁰ Mwenesi found that the average number of days between onset of illness and visit to a health facility was three days. Mothers gave different reasons for the three days time lag, though they were generally treating their children promptly, within 24 hours of illness onset.¹¹ Another Kenyan study investigating fatal childhood illnesses in Siaya showed that the median delay in consulting a health provider after onset of symptoms was 2 days.¹² In Uganda, Nshakira et al reported a waiting period of 3.6 days (median) following treatment at home.¹³

A study done in coastal Kenya showed that mother's tended to categorize their children illnesses into serious, mild and mundane. Some illnesses that present with symptoms considered mundane such as cough, fever, headache and diarrhoea can be life threatening. Since the perception of the mothers, and the decisions of others involved in diagnosing and making decisions for health care, determine the promptness with which care is sought, 'delay' or lateness in seeking help or doing something about a 'mundane' symptom may have serious and/or fatal consequences. For example all these 'mundane' symptoms could be indicative of mild malaria. Prompt treatment for malaria is important as typically the mean duration between onset of symptoms and development of severe complications is 1.8 days and the mean duration between onset and death is 2.8 days.¹¹ Nyamongo described an almost similar perception among mothers in the slums of Nairobi.¹⁴

In a study done in Kilifi, Kenya, it was found that the most common actions taken in the management of childhood fevers were the purchasing of drugs from the shops (47%), visits to private clinics or hospitals (20%), and other forms of therapy in the home. Visits to government hospitals constituted 10% of the actions taken. Home treatment and the purchasing of drugs from the shops generally took place in the same day or the day after the symptoms were first observed (67%).¹⁵ Another study showed that in some cases medical care was sought promptly for most severely ill children, but the choice of providers was inappropriate or the overall quality of care poor.¹⁶

D'Souza reports that some illnesses were recognized as 'not-for-hospital'. Additionally, past experience with similar illnesses can motivate mothers to play a 'waiting game' to see if the illness subsides on its own, particularly in situations where the cost of care is an important barrier to healthcare seeking.¹⁷ Several studies have identified local illness beliefs and others logistical problems as barriers to prompt healthcare seeking.^{18,19} Garro notes that illness and care seeking are socially and culturally embedded.²⁰ Hill et al found that health beliefs are important barriers to care seeking in addition to the maternal ability to recognize symptoms.⁸ Other studies have reported that care-seeking behaviour is predicted by household size, age and education of mother. Lack of access to health care has also been noted to be a common deterrent to optimal health care seeking in both rural and urban communities.²¹

A study done in Tbilisi, Georgia showed that health care services are a financial burden and that private (out-of-pocket) payment creates financial barriers to accessing health services. Members of the poorest households are less likely to seek care than people from more affluent households. Even if the poor spend less or equal amounts on coping with illness, the percentage of the monthly or annual income is higher among the poor than the rich.²²

In Guatemala it was shown that families are much more likely to seek treatment from a provider when a child experiences fever and gastrointestinal symptoms such as vomiting or diarrhea, as compared with respiratory and other symptoms, whether or not the mother assesses these symptoms as serious.²³ In Nepal, a country with a per capita income of \$240 per year, it was found that children with more than one symptom were more likely to receive appropriate and prompt care. Although the mothers recognized the childhood illness as serious, a large proportion of them did not seek appropriate and prompt care. Most often the care was sought from pharmacies instead of qualified medical practitioners.²⁴ Elsewhere also, it's been shown that perceived illness severity, maternal recognition of certain signs and symptoms of childhood illness were critical factors determining health care seeking behaviour.²⁵ Tupasi et al also identified poor symptom recognition ability by the care takers as an important barrier to timely care seeking.²⁶

Most of the published studies done on the area of care seeking behaviour for illness have been community based. This probably reflects the fact that most of them are done by sociologists, anthropologists and other social scientists who operate most of the time outside hospital settings. It is hoped that the current study will shed extra light on this matter, being a hospital based study conducted in a clinical environment and therefore able to relate real illness to care seeking habits and subsequent outcomes. Besides it's also hoped that information coming from this study will help the health workers attending to ill children in Kenya's largest hospital to better understand the circumstances of these children and their caretakers and how this may relate to their clinical outlook.

In public health, several conceptual models for health care utilization have been proposed. These models include the health belief model, the health care utilization model (Socio-Behavioural model by Andersen and its diverse variations), the 4As (availability, accessibility, affordability, acceptability) model, the pathway models, and the decision making models. All models contain associations of variables which are considered relevant for explaining or predicting health seeking behaviour.²⁷

CHAPTER TWO

2.0 STUDY JUSTIFICATION AND OBJECTIVES

2.1 Research Question

What are the factors that are associated with late health care seeking behavior among the acute severely ill children and their caretakers who present to Kenyatta National Hospital?

2.2 Study Justification

Improvement in family and community healthcare practices is one of the three components in the implementation of the IMCI strategy. It entails the ability of recognizing when sick children need treatment outside the home and seeking care from appropriate care providers. The IMCI strategy integrates all available measures for disease prevention and health problems during childhood, for their early detection and effective treatment and for promoting healthy habits within the family and community.

Quite often, the severity of childhood illness as seen in day to day clinical practice is a function of the duration taken before the children get the appropriate care from qualified health worker.

No studies have been done in Kenyatta National Hospital to describe factors associated with and probably therefore influencing the caretakers' health seeking practices for childhood illness. In particular those factors that are associated with late presentation to Kenyatta National Hospital and their association with the severity of illness and outcome following care at the largest referral health institution in Kenya, have not been studied.

2.3 Utility

Identification of key factors determining the healthcare seeking behaviour is helpful for planning health policy interventions. In order to respond to community perspectives and needs, health systems and policy makers need to develop strategies

while taking into account the findings from behavioural studies. The knowledge of the factors determining healthcare seeking will contribute to the realization of the Fourth Millennium development goal, which aims to reduce child mortality. Being a prime health provider in Kenya, KNH will be in the forefront of this goal's realization.

2.4 STUDY OBJECTIVES

Primary

- ◆ To determine the factors associated with late presentation to Kenyatta National Hospital among the acute severely ill children aged between 2-59 months.

Secondary

- ◆ Compare outcomes of care between those children brought in early and those brought late to KNH.

CHAPTER THREE

3.0 MATERIALS AND METHODS

3.1 Study Design:

Hospital-based Case control study.

3.2 Study area/Setting:

The study was carried out at the Kenyatta National Hospital Paediatric Filter Clinic and the four paediatric wards. Kenyatta National Hospital is the largest public hospital in Kenya. It is located in Nairobi, the capital city. It is both referral centre for paediatric cases (defined as up to 12 years of age), as well as a primary health facility for sick children mostly serving the residents of Nairobi, and a good number of children from the bordering districts. A few children, mostly referral cases requiring sub-specialist care and more intensive management come from far flung Districts.

The Kenya Government policy on cost sharing for health care exempts children below 5 years of age from payments except for a basic small fee to cover for consultation card and file. Other costs are however heavily subsidized by the government. The government also operates a National Health Insurance Fund (NHIF) that draws membership from both the salaried and non salaried citizenry and helps meet most of the inpatient bills for its members. The scheme is open to all Kenyans willing to make a minimal monthly contribution of ≈US\$2.5*

KNH as a government parastatal is required to raise a substantial cost from the patient, in order to cover some of its running expenses. As a result user fees are charged on all patients including children of all ages. There is a waiver system however, to identify and assist the needy patients and no patient is denied life saving and emergency care due to an inability to raise funds to meet the hospital bills. The daily bed fee for a child admitted with a caretaker in the hospital is KSh 600 (≈US\$9*). Besides this, at the point of registration, patients are required to pay for a consultation card, file and an admission deposit, all totaling to KSh 4500 (≈US\$70*). Other expenses depend on the type of treatment given to each individual child.

*1 US \$= KSh 65 at time of this study

Sick children below 12 years with medical conditions are first seen at the Paediatric Filter Clinic (PFC). A triage system is in place at the registration point upon entry into the clinic. Here, children with emergency signs and those looking obviously ill are noted and moved to a designated resuscitation area where clinicians, most of whom have gone through the WHO and MOH Emergency Triage And Treatment (ETAT) training, attend to them. This Triage system has been one of the most critical developments in recent times in the management of critically ill children brought to Kenyatta National Hospital.

3.3 Study Period:

This study was carried out between the months of November 2007 to February 2008, both months inclusive (4 months).

3.4 Sampling Method:

Subjects were selected on a consecutive sampling basis. Either the principal investigator or one of two trained assistants was available at the Paediatric Filter Clinic (PFC) to recruit subjects between Monday to Friday and on at least one day of every weekend during the study period, both day and night. A truncated history was sufficient to determine whether a subject met the set inclusion criteria. The emergency care of the child was not interrupted by the interview or other matters relating to the study.

3.5 Study population:

The study population comprised of i) caretakers of children aged 2-59 months who presented with a severe syndrome and was triaged for emergency management at the PFC, and ii) their children.

3.5.1 Inclusion criteria:

- Any sick child between 2 months and 59 months seeking care in the paediatric filter clinic, with acute severe syndrome and accompanied by a primary caretaker/or proxy of the primary caretaker.
- Children triaged as having an emergency sign(s) or symptom(s) (i.e. meeting the IMCI/ETAT severe illness definition), and thus requiring prioritized management in the resuscitation area in PFC.

- Caretaker consent to take part in the interview.

3.5.2 Exclusion criteria:

- Children with severe syndrome not accompanied by primary caretaker or such other person as is sufficiently familiar with the child.
- Children with chronic illness or relapsing chronic disorder (more than 1 month).

3.5.3 Definitions:

Cases: Children who presented to KNH **beyond** 3 days for first time since illness onset during current morbidity, aged 2-59 months, severely and acutely ill

Controls: Children who presented to KNH **within** 3 days for the first time since illness onset during current morbidity, aged 2-59 months, severely and acutely ill

Acute severe syndrome: Illness demonstrating symptoms, signs or course of intense character, of relatively short duration from onset, and meeting the IMCI severe syndrome definition. (See Appendix iii). These are syndromes whose acute management usually calls for one or more of six immediate and distinct therapeutic strategies, that is, parenteral antibiotics, parenteral antimalarials, Intravenous fluid resuscitation, oxygen, specific nutritional support and potentially blood transfusion.

Late presentation: In this study, does not imply 'delay' in seeking care. It's used in relationship to care seeking at KNH that took longer than 3 days from illness onset, regardless of whether care had been sought elsewhere or not. It's to be taken into consideration also that many other caretakers seek care in KNH within 3 days of illness onset, and both sets are drawn from the same population. 'Late' can stand in as a proxy for 'delay' however, because most of the delay scenarios will appear within the late presenting group.

3.6 Procedure:

The entry point into the study was severe illness (Appendix II and III). Patients presenting to KNH paediatric filter clinic are usually triaged at the point of registration by an ETAT trained nursing staff into those with emergency signs and symptoms and the obviously very ill looking children. These children are seen on a high priority basis in the resuscitation area. In the vast majority of cases, children with these signs require inpatient care after the initial stabilization. A few cases of the severely ill children do not need active resuscitation as such but still require prompt attention from the most qualified clinician available. In PFC, this happens to be the resuscitation room where a paediatric resident or qualified paediatrician is stationed. Children who were sent to the resuscitation room were candidates for the study, after satisfying the inclusion /exclusion criteria.

Eligible subjects were to be either cases or controls. Cases were picked first based on illness severity (acute severe illness) defined on presence of any of the following: severe dehydration, shock, severe palmar pallor, severe febrile illness (temp $>39^{\circ}\text{C}$) in a 'toxic' looking child, severe respiratory distress, prostration (includes loss of consciousness), and active convulsions at time of presentation to KNH which was anytime beyond 3 days after the recognition of illness. The caretakers' cue as to when they thought the child got ill was counted upon as the initial point of illness. Three days has been shown to be the average time lapse/ 'waiting time', taken by caretakers between onset of illness and visit to the health facility in two studies done in Kenya.^{9,10}

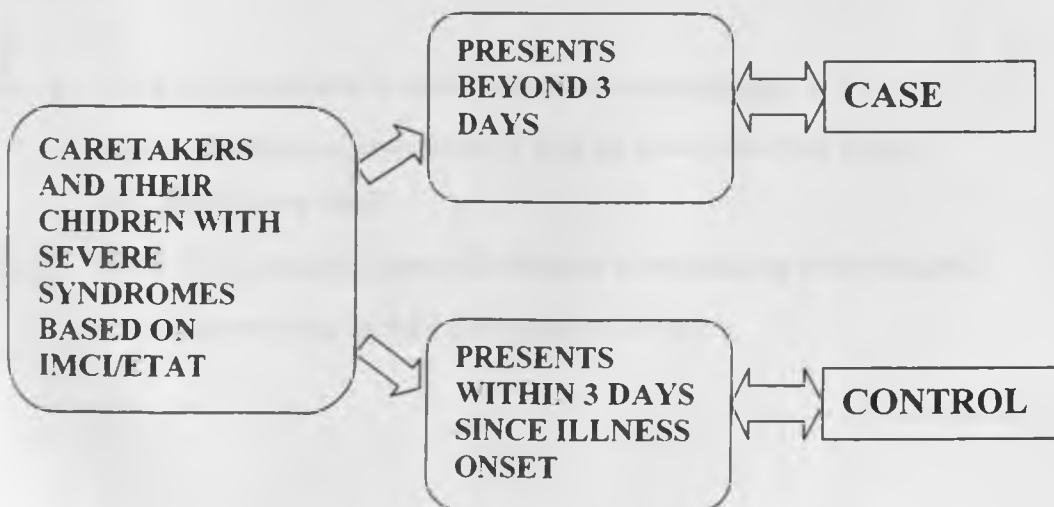
One control for each case was picked from the same population of severely ill children but who presented within 3 days of recognition of illness. It was not possible to match the cases specifically on the illness characteristics due to the heterogeneity of the symptom combination. Other parameters matched for were sex of the child and age (to within 3 months difference of case either younger or older). Only one case was intersexually controlled for. It was not feasible in this study to control for the caretaker factors.

A two stage questionnaire was administered to the primary caretaker. Most data was gathered at the paediatric filter clinic. A clinical documentation of the signs and symptoms was made using a structured data collection form (See Appendix ii).

The Caretakers were informed of the study in simple language after which they were given a consent form to read and sign. For those who could not read or understand English however, a verbal explanation of the consent form was done in Swahili and left thumb printed for consent. A unique serial number was given to every questionnaire, and details of the inpatient number registered in separate notebook, for the ease of follow-up in the ward. Subsequently, the caretakers were followed up to the wards and a day by day check was made to document the outcome of illness and the duration of hospital stay up to the point at which discharge by the clinician was made, which constituted the second stage of the questionnaire.

A pilot study was carried out in September 2007 to pretest the questionnaire and involved ten caretakers who were not involved in the final analysis.

Figure 1 : Diagrammatic representation of subject recruitment



3.7 Ethical Considerations

Approval to carry out the study was obtained from the KNH Ethics and Research Committee (Appendix V). The Caretakers or the Guardians were informed of the study in simple language. Consent was sought from the Caretakers to take part in the interviews. To ensure confidentiality, Inpatient numbers and study serial numbers were used to help identify the children and for follow up.

Emergency care and resuscitation of the child took priority over any matters relating to the study. No one was coerced to take part in the study.

3.8 Sample size estimation:

Sample size was calculated using the following formula for the calculation of a sample size in a case control study evaluating the difference between two groups

$$N \text{ (for each group)} = \frac{(p_0q_0 + p_1q_1) (Z_{1-\alpha/2} + Z_{1-\beta})^2}{(p_1 - p_0)^2}$$

N= Sample size

P_i = The proportion of exposure among cases

p_0 = The Proportion of exposure among controls.

$q_i = 1 - p_i$

$q_0 = 1 - p_0$

$Z_{1-\alpha/2}$ = Value of the standard normal distribution corresponding to a significance level of alpha (that is, **1.96** for a two sided test at the 0.05 significance level)

$Z_{1-\beta}$ = Value of the standard normal distribution corresponding to the desired level of power (that is, **0.84** for a power of 80%)

$p_i = 0.50$ (Use 50%, being the percentage of episodes of illness among children recognized as "severe/could have killed" by the Caretakers that were taken to a health facility in Ghana, 2003)

$p_0 = 0.61$ (Use 61%, being the percentage of mothers who took the child to a medical doctor and who did so within 24hrs from the recognition of the illness in a study done in Western Nepal, done in 2005)

$q_i = 1 - p_i = 0.39$

$q_0 = 1 - p_0 = 0.50$

$Z_{1-\alpha/2} = 1.96$

$Z_{1-\beta} = 0.84$

$N = 154$ for each group

308 caretakers in both groups

3.9 DATA PROCESSING AND ANALYSIS

3.9.1 Data Analysis

Data from the interviews was recorded in questionnaires and a structured clinical data collection record.

Data was entered using EpiInfo (Version 3.3.2, Centers for Disease Control and Prevention 2005, Atlanta, GA). The data was then cleaned and transcoded.

Statistical analyses were performed using Intercooled STATA (Version 9.2, Stata Corporation, College Station, TX) and SPSS vs 11.5.1. (SPSS Inc. 2002)

Univariate analysis was done on each of the variables to compare their significance on a singular basis. The association between dichotomous discrete variables was assessed using Pearson's chi-square test (χ^2) or Fisher's exact test. Normally distributed continuous data and means were compared using the students t test, while continuous data that was not normally distributed and medians were tested using the non parametric tests eg Wilcoxon rank sum test. Variables associated with late presentation at a level of $P < 0.10$ in univariate analysis were included in multivariate logistic regression modeling.

Using STATA, two models were first created that separated the variables broadly into clinical and non clinical characteristics. The models were tested for goodness of fit by the likelihood ratio test (*lrtest*). The variables were sequentially eliminated from a saturated model and were retained if their removal resulted in poor fit of the reduced model. Subsequently the two final models in each group were conglomerated and a single final model made. Variables with P values less than 0.05 in the logistic regression were considered to have a significant multivariable association with the duration of illness before seeking care in KNH. Those with P values >0.05 and <0.10 were considered to provide weak evidence of multivariable association.

Results are displayed using frequency tables, and graphs as appropriate.

3.9.2 Dissemination of results:

The results of the study will be distributed to the university library and the Department of Pediatric and Child Health, University of Nairobi. A copy of the report shall also be

availed to KNH ethics and research Board to be compiled into their database to assist other /future researchers to extract information necessary in the area.

Effort shall be made to have the report published in scientific journals and other fora.

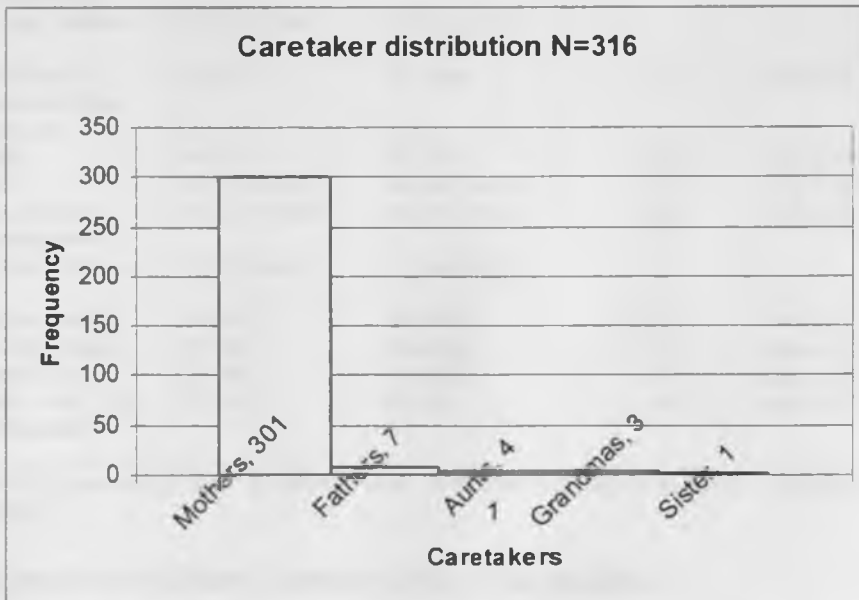
CHAPTER FOUR

4.0 RESULTS

In the study, 316 caretakers were interviewed and the outcome of their children illnesses in terms of length of hospitalization and/or mortality determined on follow up during their period of hospitalization. Out of this, 158 (50%) caretakers sought care later than three days (cases) and they were controlled by an equal number of caretakers and their children who sought care within three days.

Study population

Of the 316 caretakers interviewed, 301 were mothers, 7 fathers, 4 aunts, 3 grandmothers and 1 sister. The graph below (Figure 2) depicts this distribution. Male children were 177 and girls were 139. Among the boys, 89 were brought within three days while 88 were brought later than three days, while for the girls 69 were brought within three days and 70 were brought later than three days. Of the ill children in the study population, 8% succumbed to the illnesses while 92% were discharged home alive after varied lengths of hospitalization.



Characteristics of the caretakers and their families

Table 1 shows the demographic and social characteristics of the caretakers for children presenting to KNH before and after a lapse of three days from illness onset. Most of the caretakers stayed in Nairobi at the time of the interviews and were from the Christian faith. Mothers and fathers education and employment status, their mean ages, and the size of the households were not significantly different between the two groups. None of the caretaker characteristics between the two groups achieved statistical significance ($p>0.05$).

Table 1 : Caretaker sociodemographic characteristics

Characteristic	Cases [Presented after 3 days (n=158) (%)]	Controls [Presented within 3 days (n=158) (%)]	OR	95% CI	p*
Mother is caretaker	150 (95)	151 (96)	0.87	0.26-2.82	0.79
Employment of mother					
Unemployed	108 (70)	98 (63)	1.00	-	-
Informal	29 (19)	34 (22)	0.77	0.42-1.42	0.37 †
Formal	17 (11)	23 (15)	0.67	0.32-1.40	0.25
Education of mother	83 (54) n=154	69 (45) n=155	1.46	0.91-2.34	0.10
Primary and below					
Mother age (Mean ± 1SD)	26.5 yr (± 5.4)	26.7 yr (±5.4)	-	-	0.79§
Mother is married	136 (86)	141 (89)	0.75	0.36-1.54	0.39
Employment of father					
Unemployed	6 (4)	5 (4)	1.00	-	-
Informal	54 (39)	52 (36)	0.87	0.20-3.64	0.82 †
Formal	78 (57) n=138	86 (60) n=143	0.76	0.18-3.11	0.65
Education of father	49 (36) n=138	38 (27) n= 143	1.52	0.89-2.62	0.11
Primary and below					
Fathers age (Mean ± 1SD)	32.5 yr (±6.3)	31.9 yr (±5.6)	-	-	0.40§
Residence in Nairobi	137 (87)	137 (87)	1.00	0.49-2.02	1.00
Religion is Christian	153 (96)	146 (92)	2.52	0.80-9.32	0.08
Both parents alive	136 (86)	141 (89)	0.75	0.36-1.54	0.39
Household size (less than 4 occupants)	101 (64)	88 (56)	1.41	0.88-2.27	0.14

*: Pearson's chi square (X^2) test §: students t-test †: Pearson's chi square on a form of earning compared to no employment

Demographic and illness Characteristics of the children

The demographic characteristics of children brought in within and after three days of symptom recognition were almost similar. (Table 2) The table also shows the distribution of symptoms as reported by caretakers. It shows that cases had greater likelihood of having fever, cough or diarrhea as symptoms compared to controls. ($p=0.04$, 0.02 and 0.01 respectively). The distribution of the other symptoms is more

or less similar among the cases and controls. There was essentially no difference in the gender distribution of children in the study ($p=0.91$) Cases were slightly younger than controls (7 months versus 10 months), and this was statistically significant on its own ($p=0.04$). However, after logistic regression (table 6), this significance was lost.

Table 2: Demographic and illness characteristics of the children

Characteristic	Cases	Controls	OR	95% CI	p§
	[Presented after 3 days (n=158) (%)]	[Presented within 3 days (n=158) (%)]			
Male sex	88 (56)	89 (56)	0.97	0.61-1.56	0.91
Age months (Median, IQR*)	7 (2-59)	10 (2-59)	-	-	0.04 ^μ
Birth order ≤ 2	115 (73)	105 (66)	1.35	0.81-2.25	0.22
Siblings ≤ 2	134 (85)	130 (82)	1.20	0.63-2.29	0.54
ANC visits <4	40 (25)	32 (20)	1.33	0.76-2.35	0.28
Immunization status uptodate	151 (96)	154 (97)	0.56	0.12-2.26	0.36
Symptoms					
Diarrhoea	88 (56)	64 (40)	1.90	1.18-3.04	0.01
Vomiting	79 (50)	66 (42)	1.39	0.87-2.23	0.14
Cough	98 (62)	77 (49)	1.72	1.07-2.76	0.02
Difficulty breathing	73 (46)	75 (47)	0.95	0.60-1.51	0.82
Fever	144 (91)	132 (84)	2.03	1.01-4.38	0.04
Convulsion	44 (28)	57 (36)	0.68	0.41-1.13	0.12
Refusal to feed	14 (9)	8 (5)	1.82	0.69-5.16	0.19
Difficulty rousing	4 (3)	5 (3)	0.79	0.15-3.77	1.00¶

§: Pearson's χ^2 , unless stated otherwise μ : Wilcoxon rank sum test *IQR = Inter-quartile range ¶ Two sided Fisher's Exact

The table below (Table 3) represents the key signs that marked severe illness as they occurred among the children. It can be seen that signs related to diarrhoea and vomiting (severe dehydration /shock), and difficulty breathing (tachypnoea, chest wall indrawing) comprise the majority of severe illness conditions among the two groups. High fever was also a prominent feature. It can be seen though that the total events in the two groups were just about equal. The events are more than the total number of subjects because multiple signs could and did occur in an individual child.

Table 3: Distribution of the major signs among the groups

Sign (Marker of severe illness) §	CASES	CONTROLS
	N=158 (%)	N=158 (%)
Severe Dehydration/shock ¶	102 (65)	98 (62)
Severe palmar pallor (+++)	15 (9)	8 (5)
Severe Febrile illness (Temp $\geq 39^{\circ}\text{C}$) in a 'toxic' looking child	76 (48)	94 (59)
Severe Respiratory distress (include deep acidotic breathing, obstructed airway, \pm tachypnoea, chest wall indrawing, \pm cyanosis)	90 (57)	78 (49)
Prostration (<1 yr=unable to breastfeed/drink, older child unable to sit without support; altered consciousness)	46 (29)	32 (20)
Active convulsions at casualty	24 (15)	30 (19)
Total events	353	340

§: Only one sign was needed to imply severe illness, but one child could have several signs

¶: Majority of shock seen in this study was primarily hypovolaemic in nature

Care seeking route and options

The routes followed by the caretakers in seeking care during the current illness are tabulated in table 4. The options included visits to private clinics and private hospitals, visit to other public health institutions, buying medicine from shops and consulting pharmacists, using traditional medicines and directly seeking care from home to KNH. The same table also outlines the first steps taken by the caretakers when they realized the child was unwell. In terms of coming directly to KNH from home, the cases were less likely to do so than the controls [OR 0.22 (CI 0.10-0.45)] and this was statistically significant ($p=0.001$). Cases also had greater likelihood of having pursued other options prior to coming to KNH as shown in the $\text{OR} > 1.00$ in all the other options. One statistically significant difference between the two groups was in the use of traditional medicines (herbs) more by the cases ($p=0.0004$). A univariate analysis of route done with the option of coming directly to KNH being taken as the baseline most appropriate, showed that coming later than 3 days was associated with a OR of 53.8(CI 6.43-449.1), 5.73(CI 2.07-15.8) and 4.07(CI 1.96-8.44) if care given was herbal, pharmacy prescription/shop-bought medicine and private clinic consultation respectively. Regarding the initial action taken when child fell ill, cases tended to wait more to see what happens, and also bought medicine first from the shop or pharmacy more than the controls. Cases also had a lesser likelihood of being rushed to a clinic or hospital the same day illness was noted.

Table 4: Univariate analysis of the routes to seeking care during this illness

Characteristic	Cases	Controls	OR	95%CI	p*
	[Presented after 3 Days (n=158) (%)]	[Presented within 3 days (n=158) (%)]			
Route taken					
Home KNH	12 (8)	43 (27)	0.22	0.10-0.45	0.001
Home private clinic KNH	67 (42)	59 (37)	1.24	0.77-1.99	0.36
Home other public centre KNH	48 (30)	43 (27)	1.17	0.70-1.96	0.53
Home..Pharmacy/shop KNH	16 (10)	12 (8)	1.37	0.58-3.29	0.43
Home Herbal KNH	15 (9)	1 (<1)	16.5	2.46-321.2	0.0004 §
Initial action taken					
Rush to clinic the same day	21 (13)	62 (39)	0.24	0.13-0.43	0.001
Buy shop/Pharmacy med	55 (35)	37 (23)	1.75	1.04-2.95	0.03
Wait to see what happens	64 (41)	43 (27)	1.82	1.11-3.01	0.01

* Pearson's χ^2 ; §: Two sided Fisher's exact (some cells have numbers ≤ 5)

Miscellaneous factors

Table 5 below represents other predictor variables that were assessed in the study. These include the effects of past experience with previous disease and death of a child in the family, and the ability to meet initial treatment bills. The contribution of worries and fears concerning KNH on the caretakers' cues in bringing a child here were also probed.

Table 5: Insurance cover, Ability to pay, Major Worry, decision maker and Effect of Past medical experience

Characteristic	Cases [Presented after 3 days (n=158) (%)]	Controls [Presented within 3 days (n=158) (%)]	OR	95% CI	p
Payment Indicators					
Insurance covered	36 (23)	50 (32)	0.64	0.37-1.08	0.08
Payment of initial admission fee ¶					
Nothing vs	83 (52)	84 (53)	1.00	-	-
Less than 2000 KSh	56 (35)	47 (30)	1.21	0.72-2.03	0.46 †
≥ 2000 KSh	19 (12)	27 (17)	0.71	0.35-1.45	0.31 †
Major Caretaker worry					
No worry	36 (23)	57 (36)	0.52	0.31-0.88	0.01
Long queues	20 (13)	22 (14)	0.90	0.44-1.81	0.74
Poor staff etiquette §	1 (<1)	2 (1)	0.50	0.01-9.65	1.00 *
Cost concerns	74 (47)	53 (34)	1.74	1.08-2.82	0.02
Other worries	27 (17)	24 (15)	1.15	0.60-2.20	0.65
Decision to seek care					
Decision maker is mother	74 (47)	83 (53)	0.80	0.50-1.27	0.31
Decision made both parents	62 (39)	58 (37)	1.11	0.69-1.80	0.64
Prior admission (KNH or elsewhere)					
With this child	27 (17) n=158	48 (30) n=158	0.47	0.27-0.83	0.01
With sibling	34 (31) n=109	29 (25) n=117	1.38	0.74-2.57	0.28
Death of child before	14 (9)	13 (8)	1.08	0.45-2.60	0.84

†: Pearson's Chi square test for this feature compared to no payment;

*: Two sided Fisher's exact

¶: Initial admission fee was KSh 4300 at time of this study (~ 66 US \$)

§: Poor staff etiquette concerns arose either from previous hospitalization, shared experiences, media or just personal perception

Cases were less likely to have any insurance cover compared to the controls [OR=0.64(CI 0.37-1.08)]. This feature though was only weakly statistically significant ($0.05 < p < 0.10$). There were only two forms of Insurance cover noted in the study population, the government run National Hospital Insurance Fund (NHIF) taken by 84 caretakers, and a self-help cover called Jamii Bora Trust taken by 2 families. In terms of the-out-of-pocket payment for the initial admission fee, cases who could pay nothing were comparable to the controls in that respect (52% vs 53%). Worrying about cost was a major worry among the cases than in the controls [OR=1.74(CI 1.08-2.82)]. Cases were less likely to have 'no

worry' when considering coming to KNH [OR=0.52(CI 0.31-0.88)]. Prior admission with this child also seemed to have an influence on the care seeking promptness to KNH, with more cases than controls having no previous admission experience with this child ($p=0.01$).

Logistic regression analysis

The relationships between the clinical and sociodemographic predictor variables and the promptness of coming to KNH were explored in a logistic regression model. Age and sex were included in this model to control for confounding due to their influence.

A saturated model was first made with all the parameters tested together. In this model, after sequential elimination through likelihood testing, only the route to seeking care, the initial step taken by the caretaker when child was unwell, and symptoms of cough or diarrhoea were found to be significant with a likelihood ratio test of ≤ 0.05 . Caretaker worries concerning KNH was weakly significant as a factor likely to lead to late healthcare seeking there ($0.05 < p < 0.10$). The final reduced logistic regression model is as shown in table 6 below.

Table 6: Results of logistic regression model. (95 % confidence intervals given in parentheses)

Parameter	Unadjusted OR*	Adjusted OR †	p- Value §
Cough	1.72 (1.10-2.69)	2.09 (1.23-3.56)	0.007
Diarrhoea	1.90 (1.21-2.96)	1.57 (0.91-2.73)	0.04
Fever	2.03 (1.01-4.04)	2.61 (1.42-3.02)	0.12
Any caretaker worries about KNH	1.72 (1.02-2.88)	1.63 (0.97-2.76)	0.06
Route followed			
Home. KNH	1.00	1.00	-
Home. other Public health centre. KNH	4.00 (1.87-8.56)	3.72 (1.64-8.40)	0.002
Home. shop/ Pharmacy. KNH	5.73 (2.07-15.8)	3.15 (1.05-9.47)	0.041
Home. private clinic. KNH	4.07 (1.96-8.44)	3.30 (1.52-7.17)	0.003
Home. Herbs. KNH	53.8 (6.43-449.1)	41.7 (4.70-369.1)	0.001
Initial step taken by caretaker when child fell ill			
Rush to hospital/clinic	1.00	1.00	-
Buy med from shop/pharmacy	4.39 (2.30-8.38)	4.12 (1.98-8.54)	0.001
Wait to see what happens	4.39 (2.35-8.23)	4.10 (2.04-8.22)	0.001
Other action	3.32 (1.44-7.66)	2.96 (1.18-7.45)	0.02
Age	0.97 (0.96-1.00)	0.99 (0.97-1.01)	0.37
Sex	0.97 (0.63-1.52)	1.03 (0.62-1.71)	0.91

*: Unadjusted as in Univariate analysis; †: Adjusted for the other factors in the regression;

§: Likelihood ratio test

Health Outcomes

Two outcomes were assessed in the study; the length of hospitalization and the survival outcome (i.e. mortality or not). The median number of days stay as inpatient were 7 in the late presenting group compared to 5 in the early presenting group and this was only weakly significant ($p=0.05$). It also can be seen that the late presenting group had a statistically significant likelihood of death compared to the early presenting group ($p=0.001$). Table 7 below presents these differences.

Table 7: Health Outcomes; length of hospital stay and survival outcome among the two groups

Outcome	Cases [Presented after 3 days (n=158) (%)]	Controls [Presented within 3 days (n=158) (%)]	P
Length of hospitalization in days (Median, IQR)	7 (1-84)	5 (1-71)	0.05 [#]
Survival outcome			
Alive	137 (87)	153 (97)	0.001 [†]
Dead	21 (13)	5 (3)	§

: Two Sample wilcoxon rank-sum test † : Pearson's X^2 [OR 0.21, 95% CI (0.07-0.62)]; § : OR for dead [4.69 95% CI (1.62-14.6)]

Among the 26 children who died in the study population, 14 (54%) were females and 12 (46%) were males. Of the deaths, 21 (81%) occurred in the cases and 5 (19%) in the controls. In the deaths among the cases, 18 (69%) were infants (age 2-11 months), while 3 (12%) were aged 12-59 months. Among the 21 children in the case group who died, herbs were used by 8 (30%) and symptoms of diarrhoea, cough, difficulty breathing or fever were present in this group in 12(46%), 13(50%), 14(54%) and 16(62%) respectively. In terms of length of hospital stay among the cases who succumbed to their illnesses, 13 (50%) stayed in hospital for periods between one week and one month compared to only 1 child in the control group who stayed a similar duration and finally died.

CHAPTER FIVE

5.0 DISCUSSION

This study sought to address an observation that has been of concern in the paediatric clinical arena in Kenya's largest tertiary health care facility. This observation has been that a good number of the acute severely ill children seen and attended in the hospital appear to have had an intriguingly long time with acute symptoms before being brought here. Consequently, the level of illness in some of these children is so severe as to affect options of management and survival outcome. It is worth stating that over the years, many residents from within and near Nairobi bring their children including the 'not so ill' be attended in KNH, notwithstanding that this is a tertiary and referral institution. The hospital however has not actively required that ill children seen here must have been seen elsewhere, a situation different from the adult casualty department. In essence this study does not use the word late to mean 'delay'. The purpose of a control group from the same population was to try and see if there are associations in the lateness at presentation that cannot be ascribed to chance only and therefore can benefit from an act of intervention.

Mothers comprised the majority of the caretakers (95%) and their distribution among the two groups was similar. Fathers formed a very small group of the caretakers and this probably reflects the fact that unemployment and homemaking was more prevalent in the mothers as compared to fathers in the two groups. As a result, more mothers were available to bring their children to hospital. In this study, it was not feasible to match the caretakers on any particular feature, but as shown in table 1 in the results section the disparities between the two groups on caretaker characteristics were not statistically significant.

In this study, children brought later than three days (cases) presented more with symptoms of fever, cough or diarrhoea. Acute respiratory infections and diarrhoeal diseases still constitute a major health burden in developing countries. A similar distribution of symptoms among children who died without being taken to hospital was also found in a study done in Kilifi in coastal Kenya.²⁸ Mutai reported a frequency of

cough and difficulty breathing in 33%, and of diarrhoea and vomiting in 44% of children recruited in a study in which she evaluated through autopsies the cause of death in children brought dead or dying shortly after arrival to KNH.²⁹ Studies done elsewhere have shown that caretakers consider symptoms such as cough, diarrhoea and fever as mundane and these causes delay in seeking care for what are potentially life threatening conditions such as malaria.^{30,31}

The route followed by the caretaker was highly significant in determining whether a severely ill child was brought early or late to KNH. Cases were less likely to come here directly from home as the first point of contact with a health provider than were controls. Of the cases, 92% exploited other options first compared to 73% among the controls. Of those who exploited other options first, there were more in the cases group than in the controls group who had been attended to by a trained provider of western medical care either in private clinics or other health centers (73% vs 64%). The kind of care given to the children hitherto coming to KNH was in most cases unverified, because many of the children seen elsewhere had no referral letters, or when available, were too brief to be helpful at all. In Siaya, Renu found that only 58% of children who died in a village had been seen by a trained provider of western medical care. He also found that only 10% of those who died had been referred for higher level care after being seen in a lower health facility.¹²

In the current study, cases used shop-bought medicine and pharmacist prescriptions more often than controls [OR 1.37(CI 0.58 -3.29)]. Importantly too, a significant group among the cases resorted to herbal medicine (5%) [OR 16.5(CI 2.46-321.2)]. Even though this study lacked adequate statistical power to assess these explanatory variables, it does nonetheless depict a very common scenario that is encountered in every day clinical practice in the hospital. A Ghanaian study found that herbal remedies were the most frequently and readily elicited treatment for specific symptoms and illnesses (used in 77% of all episodes).⁸ Renu found that 51 % of caregivers consulted traditional healers in a study of terminally ill children.¹²

The progressive exhaustion of options seen in this study is a reflection of both the economic and cultural disparities seen in a large city like Nairobi where commercialization of medical services and mushrooming private practice is on the rise. Traditional healers most of who stay in the slum areas of the city have also carved their niche in a subset of the population increasingly impoverished by dwindling finances and rising cost of living. These traditional healers are reported to charge a 'friendly' fee. Some of the clinics too give 'credit' to their clientele who can pay later. Other studies have also reported a progressive exploitation of health care options.^{32,10}

On the initial steps taken by care takers when a child fell ill, more care takers in the cases group than in the control group said they waited to see how the illness would progress. ($P=0.01$). The nature and duration of the waiting was not determined but home remedies such as lemon juice and honey for coughs for instance was reported by a few. The cases didn't react as fast as the controls who would rush the child to a clinic or hospital the same day the illness began. Instead they opted to buy medicine from shops and pharmacies. ($p=0.03$). Molyneux et al found that in coastal Kenya, most fevers treated outside the household were treated using medicine bought from shops only or as the first option in 69% of cases.¹⁵ In the slums of Nairobi, Nyamongo found that when mothers did not have enough funds to go to hospital, they resorted to purchasing Over the Counter (OTC) drugs cheaply as they looked for money incase the situation worsened. She also noted that mothers in the slums do not change healers in close succession and that they took their time to observe the situation before making a switch.¹⁴ The current study avers to this scenario in that more caretakers in the case group than in the control group had bought medicine from shop and pharmacist first before seeking care in KNH.

There was greater likelihood to worry about the cost of treatment in KNH among the cases, and also to have other worries in general. Even though caretakers worried on cost, many confessed that the life of the child was preminent to other considerations. This is in agreement with a study done in Tanzania that found that on the overall, while user fees

deterred adult patients from seeking prompt treatment for their illnesses at a government health facility, the same was not the case with young children⁹

In this study, it was found that the average duration of hospital stay was prolonged in those who came late than those who came early. The difference in length of stay in the two groups was weakly significant ($p=0.05$). Some options such as the use of herbal medicines whose efficacy and dosage are not established can fail to treat a primary illness or precipitate more severe illness. The caretakers bringing their severely ill children later than 3 days end up being required to pay higher hospital bills than those who bring their children early, thus probably explaining why they are more worried of cost issues than do those who come early. In this study, it was found out that, the risk of dying was about 4 times increased in the late presenting group (12% versus 3%). This was highly significant difference between the groups ($p=0.001$). Apparently, the initial 'golden hours' during which this patients would get maximum benefit from early and timely intervention to help them return to health are lost when there is a long duration before being brought to KNH. Another study done in Nigeria found a similar tendency.³³

The study results could have been influenced by several types of biases. Recall bias is possible because the data was generated primarily from interviews based on recall. Misclassification could occur if the mother misrepresented what actually happened to create a more socially desirable impression, for example, by reporting that she took the child to a health center instead of buying kiosk medicine. Effort was made however to minimize this sort of bias by asking many of the questions in a repeated modified manner along the interview to ensure better clarification and counter deliberate effort to modify reality.

CHAPTER SIX

6.1 CONCLUSIONS

Late presentation for acute severe illness as seen in Kenyatta National Hospital is an interplay of a number of explanatory variables, and not simply due to lack of money to pay for health care as is commonly supposed. Many of the children brought late have had care being sourced in the peripheral facilities either from allopathic care providers or from alternative medicine.

Cough or diarrhoea are prominent symptoms that afflict those brought later than 3 days compared to those brought within three days. These symptoms are likely to be considered 'mundane' by many caretakers under normal life circumstances. This study found that many caretakers bringing their children late to KNH were likely to have bought drugs from shops and pharmacies, used herbs and 'waited' to see the progress of these apparently benign complaints that many a times are actually indicative of severe illness.

Late presentation to KNH is associated with increased likelihood of mortality and longer periods of hospitalization in comparison to early presentation among children aged 2-59 months admitted to Kenyatta National Hospital.

6.2 RECOMMENDATIONS

- i) There is need to train health workers and practitioners in the peripheries to recognize when severely ill children need more intensive management for apparently "benign" symptoms such as cough, diarrhoea, and fever. Besides this, the new concept of community IMCI should be embraced and taught to caretakers to improve their care seeking habits.
- ii) A history concerning use of herbs at home should be regularly sought for by clinicians attending to severely ill children in KNH, especially those brought late as it may help to explain some atypical presentations of their illnesses and inform treatment focus accordingly.
- iii) Other studies in this area looking at specific issues brought forth by this study are necessary, eg use of herbs in children and its implications etc.

6.3 LIMITATIONS

There was likelihood of recall bias and possible misinformation from the caretakers to give more "socially acceptable" information. The format of the study also lacked qualitative interviews eg focus group sessions, which would have added value to the issues raised by the caretakers. The study does not address the intensity of the symptoms and specific diagnoses found in the children which could explain delay in more relative terms.

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**APPENDIX I
QUESTIONNAIRE**

GROUP CODE 1- Case 2- Control

SERIAL NO. _____ **Ward** _____ **ROOM** _____

A. SOCIODEMOGRAPHIC DATA

1. Age _____ (months)
2. Gender Male
 Female
3. Birth Order 1st, 2nd, 3rd, 4th, ≥5th
4. Number of Siblings 0 1 2 3 >3
5. Relationship of Caretaker to Child
 Mother
 Father
 Grandparent
 Other relative(specify) _____
 Other Association (specify) _____
6. Status of parents Both parents alive
 Both dead
 Father dead
 Mother dead
 Single Father
 Single Mother
 Unknown
7. Age of mother _____ yrs NA
8. Age of Father _____ yrs NA

B. SES INDICATORS

9. Number of rooms 1 2 >2
10. Number of Occupants in house _____
11. Access to water Running tap water in house
 Running tap water in compound
 Water vendors
 Other eg river, etc(specify) _____
12. Sanitation Flush toilet in house
 Latrine in compound
 Outside Shared Facility eg Council facility

13. Mothers Occupation

- Unemployed
- Informal Farming Business Artisan
- Formal(wage employment)
 - <KES 5000 pm
 - KES 5000-10000pm
 - KES 11000- 20000pm
 - >KES 20000pm
- NA

14. Fathers Occupation

- Unemployed
- Informal Farming Business Artisan
- Formal(wage employment)
 - <KES 5000 pm
 - KES 5000-10000pm
 - KES 11000- 20000pm
 - >KES 20000pm
- NA

15. Mothers Education

- None
- Part Primary
- Completed Primary
- Part Secondary
- Completed Secondary
- Tertiary
- NA

16. Fathers Education

- None
- Part Primary
- Completed Primary
- Part Secondary
- Completed secondary
- Tertiary
- NA

17. Place of Residence.

- Urban(Nairobi) Specify where _____
- Urban (elsewhere) _____
- Rural _____

C. OTHER SOCIAL DATA

18. Marital Environment

- Single Parent
- Married
- Separated
- Widowed
- Other (e.g. Abandoned Child) specify _____

19. Religion Christian
 Muslim
 Traditional
 None/Other (Specify) _____
20. Ante Natal Visits during Pregnancy None <4 ≥4 Unknown

D. DISEASE RELATED VARIABLES

21. Duration of illness _____ (days)

22. Chief Complaints

- Diarrhoea
- Vomiting
- Cough
- Difficulty breathing
- Pain
- Hotness of the body
- Chronic disease
- Swelling of the feet
- Wasting
- Convulsions
- Refusal to feed
- Difficulty arousing
- Other (specify) _____

23. Route for care seeking during current illness.

- Home → KNH
- Home → Private Clinic → KNH
- Home → Other Public Health centre → KNH
- Home → Pharmacy → KNH
- Home → Shop → KNH
- Home → Traditional med/ alternative med → KNH
- Other (specify) _____

24. Who made the decision to bring the Child to hospital?

- Mother
- Father
- Both parents
- Other (specify) _____

25. Have you been admitted before in any Hospital

- With this Child Yes No
- With Sibling Yes No NA

26. Have you ever lost a child to Illness?

- Yes No NA

27. If Yes above, due to what illness

- Diarrhoea
- Vomiting
- Cough
- Difficulty breathing
- Pain
- hotness of the body
- Chronic disease
- swelling of the feet
- Wasting
- convulsions
- Refusal to feed
- Difficulty arousing
- Other _____
- NA

28. Age at Death of child in No 27 above

- 0-60 days
- 2-11 months
- 1-5 years
- >5 years
- NA

29. When your child fell ill, what did you do initially in regard to seeking of healthcare?

- Rushed to hospital/clinic the same day
- Waited to see what happens
- Bought medicine from shop pharmacy according to what I suspected
- Others eg Pray, (specify) _____

30. Did you buy medicine from the local shop/ kiosk as one of the steps when you realized your child is unwell?

- Yes
- No

Such medicine includes drugs such as APC[®], Haraka[®], Mara moja[®], ENO[®]. Action[®] among many others

31. Have you ever taken **this child or sibling** to a Herbal/ Traditional Doctor/alternative medicine before?

- Yes
- No

32. Had you taken **this child** to a herbal/traditional doctor/alternative medicine **during this illness**? Yes No

E. OTHER INFORMATION/MISCELLANEOUS

33. What **worries you most** when you think of bringing your Child to KNH?

- Long Queues
- Poor staff etiquette ie Indifferent/ unempathetic staff
- Expensive(cost)
- Nothing worries me
- Other (Specify) _____

34. Are you party to any Health Insurance Scheme (Including NHIF) Yes No

35. Who is responsible for paying hospital bills if admitted?

- Self (ie the Caretakers)
- Employer
- Relatives
- Insurance Scheme(Specify) _____
- Other (specify) _____

36. How much are/were you able to pay for admission deposit?

Nothing Below Kes 2000 Kes 2000-3000 Above Kes 3000

37. Child Welfare/ immunization card produced Yes No

38. Immunization status Complete Not complete but upto date

Not Completed Don't know

CLINICAL SIGNS AND SYMPTOMS

Weight(kg) _____ IPN _____ Name Initials _____

HISTORY				EXAMINATION					
Symptoms			Duratn Days	Airway	Clear/ok	Stridor	Needs active support to open		
Fever	Y	N		Breathing	Respiratory rate		/min		
Cough	Y	N			Central Cyanosis	Y	N		
Cough>3/52	Y	N			Indrawing	Y	N		
Difficulty breathing	Y	N			Grunting	Y	N		
TEMP °C					Acidotic breathing	Y	N		
					Wheeze	Y	N		
					Crackles	Y	N		
				Circulation	Pulse	Weak	normal	/min	
					Cap refill	X	<2s	2-3s	>3s
					Pallor/anaemia	0	+	+++	
Diarrhoea	Y	N		Dehydration	Sunken eyes	Y	N		
Diarrhoea>14 days	Y	N			Skin pinch(sec)	0	1	2	
Diarrhoea(bloody)	Y	N		Disability	AVPU	A	V	P	U
Convulsions	Y	N			Can drink/ Breast feed	Y	N		
Partial/Focal fits	Y	N			Bulging fontanell	Y	N		
Convulsions now	Y	N			Can sit up alone	Y	N		
Vomits all	Y	N		General Nutrition	Visible severe wasting	Y	N		
Difficulty feeding	Y	N			Oedema of Kwashiorkor	Y	N		

ETAT Classification Emergency Priority Date Admitted _____

Illness Outcome Alive Dead Date Discharged/Passed on _____

Duration of admission(NB: Whether alive or dead) _____ (Hrs) _____ (days)

APPENDIX II: DEFINITIONS OF SEVERE SYNDROMES. (IMCI Definition)**

SYNDROME DIAGNOSIS	DEFINING CLINICAL FEATURES
Meningitis	Stiff neck + any of fits, fever, or prostration (or worse neurological status) at any age Fever + any fits + prostration and age < 2 years
Lower respiratory infection pneumonia	
Mild	History of cough or difficulty breathing plus: respiratory rate ≥ 50 if 2 mo-1 year, ≥ 40 if >1 year
Severe	Lower chest wall Indrawing
Very severe	prostration or oxygen saturation <90%, or both
Gastroenteritis (GE) with severe dehydration	Diarrhoea (watery stool > three times/day) with both sunken eyes and reduced skin turgor or prostration alone
Severe persistent diarrhoea with dehydration	Diarrhoea (watery stool > three times/day) >14 days and any of: sunken eyes, reduced skin turgor or prostration
Very severe febrile disease	Fever (as part of history or on examination) + stiff neck or any general danger sign, prostration, vomiting everything, any convulsions in the history, and unconsciousness
Severe anemia	Severe palmar pallor
Malnutrition (severe)	Visible severe wasting or oedema of both feet
Severe malaria	Prostration (or worse neurological status) and/or deep acidotic breathing and/or indrawing plus positive blood slide or unconsciousness irrespective of parasitaemia

**Prostration is identified by the direct observation of an inability to breastfeed in a child aged <1 year or the inability to maintain a sitting position in older children. Prostration has previously been shown to indicate a high risk of mortality.

APPENDIX III: EMERGENCY AND PRIORITY SIGNS: WHO ETAT GUIDELINES

Emergency signs include:

- obstructed breathing
- severe respiratory distress
- central cyanosis
- signs of shock (capillary refill longer than 3 seconds; and weak, fast pulse)
- coma
- convulsions
- signs suggesting severe dehydration in a child with diarrhoea (any two of the following: lethargy, sunken eyes, very slow return after pinching the skin)

The priority signs identify children who are at a higher risk of dying. These children should be assessed without delay. These signs include the following:

Temperature above 38.5 °C, Age less than 2months, Trauma, Severe palmar pallor, Pain , Poisoning, Referral case, Restless and lethargic, respiratory distress (not severe), visible wasting, oedema of both feet, and Major Burns.

APPENDIX IV: CONSENT FORM

Study No _____

Hospital No _____

Investigators

Dr. James M Gitau

Contact:

Dr James M Gitau

Po Box 2257-00202 Nairobi

Cell: 0723 456574

Investigators statement

Am asking you to take part in a research study. The purpose of this consent form is to give you the information you will need to help you decide whether or not to be in this study.

Introduction and procedure

The study being carried out is meant to look into matters that affect the severity of your child's illness and how much that relates to how soon you have brought your child to KNH. We will want to know the things you worry about when coming here, the medicine your child has taken before coming here, among other matters. You will be asked a number of questions that will take on average about 20 minutes of your time. Your child will also be examined to determine the nature and severity of his/her illness. No laboratory tests relating to this study will be carried out on your child, and all the care he/she needs will not be interrupted by your agreement to take part in the study. No form of monetary compensation will be availed to you for agreeing to take part in the study.

Voluntariness

The study will be fully voluntary. You are free to refuse to participate or withdraw from the study at any time. Refusal to participate will not compromise your child's care in the hospital in any way.

Benefits

The study will help doctors understand better some of the issues that make parents and guardians come to this hospital later than necessary and put into place systems to address some of the issues for better health of children in the future.

Risks

No direct or indirect risks are anticipated in the study. Only a bit of your precious time will be taken by the interviewer. The care of your child is paramount all the time.

Confidentiality

All the information you give will be treated with utmost confidence and information to identify you or your child will not be released to any person or forum without your permission.

Do you have any questions?

Do you agree to participate? YES _____ NO _____

Signature of investigator _____ Name of Investigator _____ Date _____

Caretakers Statement

I agree to take part in the above study on my own free will. I understand that Am free to withdraw from the study at any time

Signature _____ Name _____ Date _____

LHTP (Left hand thumb print) _____ Name _____ Date _____

APPENDIX V: APPROVAL LETTER FROM KNH-ERC



KENYATTA NATIONAL HOSPITAL
Hospital Rd. along, Ngong Rd.
P.O. Box 20723, Nairobi.
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP* Nairobi.
Email: KNHplan@Ken-Healthnet.org
31st July 2007

Ref: KNH-ERC/01/4617

Dr James M. Gitau
Dept. of Pediatrics & Child Health
School of Medicine
University of Nairobi

Dear Dr. Gitau

REVISED RESEARCH PROPOSAL "FACTORS ASSOCIATED WITH DELAYED HEALTH CARE
SEEKING FOR ACUTELY ILL CHILDREN AGED 2-59 MONTHS IN KENYATTA N. HOSPITAL"
(P149/6/2007)

This is to inform you that the Kenyatta National Hospital Ethics and Research Committee has reviewed and approved your revised research proposal for the period 31st July 2007 - 30th July 2008.

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 specimen must also be obtained from KNH-ERC for each batch.

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

This information will form part of database 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-ERC

c.c. Prof. K.M.Bhatt, Chairperson, KNH-ERC
The Deputy Director CS, KNH
The Dean, School of Medicine, UON
The Chairman, Dept. of Paediatrics & Child Health, UON
Supervisors: Dr. G. Irimu, Dr. D.M. Njai, Dr. D.C. Wamalwa

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