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Factors Associated with Discharge Against Medical Advice in Children Under 6 Months Admitted with Infections at Mbarara Regional Referral Hospital and Holy Innocents Children

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ABSTRACT

Background: Discharge against medical advice (DAMA) occurs when a patient /care giver in case of a child leaves a clinical setting before the end of treatment, and against medical recommendation by the medical team. This has become a major problem in health care delivery in Ugandan health facilities as it is associated with high post discharge mortality.

Objectives: The study was guided by three objectives: namely, to find out the prevalence of DAMA among children under 6 months admitted at Mbarara Regional Referral and Holy Innocents Children's Hospitals, to examine the socio-economic and socio demographic factors associated with DAMA among children under 6 months admitted with infections at Mbarara Regional Referral and Holy Innocents Children Hospitals and to establish clinical factors associated with DAMA among children under 6 months admitted with infections at Mbarara Regional Referral and Holly Innocents Children Hospitals.

Methodology: This study utilised secondary data of the Smart Discharges Study, a prospective observational cohort study to develop prognostic models for post-discharge mortality in children below 6 months admitted at the 2 hospitals with infection between March 2018 and February 2020. Data of 1074 participants was considered. Simple and multiple logistic regression models were used to examine associations between DAMA and the independent variables i.e., demographic, socio, and clinical factors.

Results: Out of the 2916 participants under 6 months of age were screened and 1194 enrolled in the study. Of these 120 children died in hospital and were excluded from this particular study, leaving 1074 participants who were considered for this study. Data of 1074 participants showed that 110 were DAMA giving a prevalence of 10.2%. In patients who were admitted at MRRH, the Multivariable results revealed that children whose mother's HIV status was positive were 4.4 times more likely to discharge against medical advice compared to children whose mother's HIV status was negative(AOR=4.4; 95% CI (11.3-15.9); p<0.001). Additionally, patients whose axillary temperature of 36°C-37.5°C were 76% less likely to discharge against medical advice compared to patients who had a temperature <36^0C(AOR=0.24; 95%CI (0.06-0.99); p<0.050). Similarly, Patients who had an axillary temperature of ≥39^0C were 82% less likely to discharge against medical advice compared to patients whohad an axillary temperature of<36^0C(AOR=0.18; 95%CI (0.03 - 0.95); p=0.044).

While Patients who were admitted at HICH and spent more than 2 hours traveling to the hospital were 74% less likely to discharge against medical advice compared to those who spent less than 30 minutes (AOR = 0.26;

95%CI(0.06 – 0.99); p=0.049).Maternal HIV status was also statistically significant with discharge against medical advice. Patients whose mothers were HIV positive were 9fold more likely to discharge against medical advice compared to their counterparts who were HIV negative (AOR = 8.9; 95%CI (6.8 – 25.8); p<0.01). Other factors were not significantly associated with DAMA.

Conclusion: Maternal HIV status, temperature and distance from facility to home were highly associated with discharge against medical advice. Understanding the specific populations at a higher risk of DAMA may provide insights into aspects of health services that need to be addressed to improve quality of care for all patients.

Background to the Study

Discharge against medical advice (DAMA) can be defined as the "patient choosing to leave the hospital (caregivers leave in case of children) before the treating physician recommends discharge [1]. This phenomenon typically involves termination of hospitalization, rejection of expert medical opinion/treatment, signing of a discharge document and leaving the hospital with the child [2]. However, in Uganda DAMA often will not involve patients signing a DAMA form or communicating their desire to leave to the physician. DAMA is encountered by health personnel all over the world and is a serious public health issue associated with risk of high rates of re-admission and complications accounting for higher costs of treatment [3]. In the United States, an estimated 2% of all hospital discharges are designated as against medical advice, increasing up to 6% in disadvantaged inner-city populations [4-6]. The prevalence of DAMA which has been reported among hospitalized children varies from 1.2% to 31.7%, depending on the population studied [7].

Infections in children are a significant cause of morbidity and mortality worldwide. In 2019, over half the 5.2 million under-5 deaths occurred in sub-Saharan Africa, and most of them were due to sepsis [8-9]. Various factors have been shown to contribute to poor outcomes from sepsis, including disease severity, malnutrition and other comorbidities as well as socio-demographic disadvantages such as poverty and low maternal education [10]. Discharge of hospitalized children against medical advice constitutes an obstacle to adequate and effective health-care delivery to these children and has the potential of increasing not only child mortality rate, but also, the frequency of long-term sequel [11]. In the context of resource limited settings, DAMA are of particular concern, with several studies showing that children who are discharged against medical advice experience substantially higher risk of mortality than their counterparts who are dischargednormally [12]. In addition, patients who leave against medical advice may utilize a disproportionate amount of health care resources if they require repeated or urgent care following discharge[13]. A Study carried out in Uganda by Lowlaavar about Pediatric in-hospital death from infectious disease in Uganda: derivation of clinical prediction models revealed that among those discharged, 120 (9.7%) were discharged against medical advice and had higher chances of post discharge mortality [14]. Such discharges are also known to be distressing to the physician and other health-care professionals involved in the care of these children [15].

Barriers to seeking adequate care in Sub-Saharan Africa are complex and can include financial constraints, distance to health facilities, cultural practices, gender dynamics, limited knowledge or information, and health facility disincentives, all of which may lead to poor health outcomes [17-18] Although DAMA occurs both in developed and developing countries, the underlying causal factors may differ [19]. Various studies have shown that financial constraint is a major determinant of DAMA in Nigeria [7]. Over the years, hospital fees payable by parents has continually been adjusted upwards in all Nigerian health-care institutions. This situation involves lack of effective health-insurance coverage in the country. Studies in different regions of Nigeria have reported Paediatric DAMA rates from 1.2% to 5.7% [7&13].

In Uganda, some caregivers do not adhere to the medical advice of following normal discharge procedure while in the hospital when their children experienced prolonged treatment because of several reasons like

financial challenges, child not improving, other obligations at home among others [20]. This is among the many reasons given by caregivers for discharge against medical advice especially when handling children aged less than 5 years. To address this issue, caregiver education given by community health workers who are drawn from within the community should be encouraged. Trusted community health workers (CHWs) contribute to improving health outcomes among mothers and their newborn babies through education [21].
Mbarara Regional Referral Hospital and Holy innocents' children's hospital are some of the health institutions that experience the issue of discharge against medical advice which has been persistent. This has mostly been observed in the children under 6 months. Currently no study has been conducted to establish the underlying predictors of discharge against medical advice such that appropriate strategies can be designed to deal with the problem. The purpose of this study is thus to identify factors associated with discharges against medical advice for children under 6 months admitted with infections in Mbarara city, Uganda.

1.2 Statement of the problem

Healthcare systems throughout the world are faced with the problem of DAMA and Uganda like the rest of the world is not exceptional. According to Lowlaavar in their study conducted in pediatric patients in Uganda found out that children who were DAMA were 4 times likely to die post discharge compared to their counterparts discharged routinely[14]. Discharge against medical advice imposes an increased burden on the health care system through disruption of patient care, disproportionate consumption of resources, and challenges to providers' ethical obligations. Studies have shown that patients complain of dissatisfaction with hospital services, environmental factors and medical factors, patient's unaffordability to pay hospital expenses, mental problems such as being depressed and frustrated, family problems (e.g. having a child at home), lack of significant improvement in medical conditions, believe in traditional medicine, long stay in hospital, and patient's place of residence (urban or rural) pose a problem to the patients hence resulting into discharge against medical advice [22].
At MRRH and HICH, substantial achievement has been made in reducing post discharge mortality by 30% in children hospitalized with severe infection. Despite the reduction in mortality, its been noted that post discharge deaths are still high especially in children discharged against medical advice.In Sub-Saharan Africa and Uganda in particular, fewer studies have been conducted on examining the socio demographic, socio economic and clinical factors associated with DAMA. In this study we hope to examine these factors. Understanding the factors leading to DAMA could help health care administrators set up more effective interventions to prevent DAMA and reduce its adverse effects and improve post-discharge outcomes for children admitted with infections. This will in turn help in the achievement of the third SDG of good health and well-beingthrough preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce under-5 mortalities to at least as low as 25 deaths per 1000 live births by the year 2030.

1.3 Research questions

i. What is the prevalence of DAMA among children under 6 months admitted with infections at Mbarara Regional Referral Hospital and at Holy innocents' children's hospital?
ii. What are the socio demographic and socio-economicfactors associated with DAMA among children under 6 months admitted with infections at Mbarara Regional Referral Hospital and at Holy Innocents children's' hospital?
iii. What are the clinical factors associated with DAMA among children under 6 months admitted with infections at Mbarara Regional Referral Hospital and at Holy Innocents children's hospital?

1.4 General Objective

The general objective of this study was to examine factors associated with DAMA among children under 6 months admitted at both Mbarara Regional Referral Hospital and Holy Innocents Children's Hospital.

1.5 Specific objectives

The study was guided by the following specific objectives;

1. To find out the prevalence of DAMA among children under 6 months admitted with infections at Mbarara Regional Referral Hospital and at Holy Innocents Children's Hospital.
2. To examine socio demographic and socio-economic factors associated with DAMA among children under 6 months admitted with infections at Mbarara Regional Referral Hospital and at Holy Innocents Children's Hospital.
3. To find outthe clinical factors associated with DAMA among children under 6 months admitted with infections at Mbarara Regional Referral Hospital and at Holy Innocents Children's Hospital.

RESEARCH METHODOLOGY

3.1 Study Design

The studyused a cross-sectional survey to determine the demographic, socio-economic and clinical factors associated with discharge against medical advice among paediatric patients at 2 hospitals in Mbarara. A cross-sectional survey was chosen mainly because the exposure and outcome were measured at the same time. This study utilized secondary data of the Smart Discharges Study, a prospective observational cohort study to develop prognostic models for post-discharge mortality. The original study was conducted at 6 hospitals in Uganda, and enrolled children 0to 6 months of age admitted with a proven or suspected infection between March 2018 and February 2020. Only data for children admitted at Mbarara Regional referral hospital and Holy Innocents Children's Hospital was utilized for this study.

3.2 Study Area

The study wascarried out in Mbarara city, southwest Uganda. It targeted children under 6 months admitted with severe infection at Mbarara Regional Referral Hospital and Holy Innocents Children's Hospital. Mbarara city was purposively chosen from among the districts in southwest Uganda because its health facilities provide care for paediatric patients hailing from many parts of the sub-region. Mbarara Regional Referral Hospital is a government aided hospital while Holy Innocents Children's Hospital is a private hospital. Mbarara city is located approximately 290 kilometres (180 miles) southwest of Kampala, the capital city of Uganda. The district has a population of about 472,625 people, with an estimated average household size of 4.2 people [23]. The majority of the households (52.7%) depend on subsistence farming as the main source of livelihood. The population within the district is served by hospitals located in Mbarara city, the area's commercial hub which has a population of 195,013 [24-25].

3.3 Study Population

The studywas carried out amongpaediatric patients under 6 months admitted with infections who were enrolled in the Smart discharges project at MRRH and HICH. MRRH is a public hospital funded by the Uganda Ministry of Health and is associated with the Mbarara University of Science and Technology Faculty of Medicine with a bed capacity of 600 beds. The paediatrics "Toto" ward admits approximately 5000 patients per year. HICH is a Catholic children's hospital offering subsidized fee for-service outpatient and in-patient care in Mbarara and admits approximately 2500 patients annually.

3.4 Sample Size and Sampling Procedure

This study usedsecondary data of the Smart Discharges Study, a prospective observational cohort study to develop prognostic models for post-discharge mortality in children below 6 months admitted at the 2 hospitals with infection between March 2018 and February 2020. At these 2 hospitals a total of 2916 participants under 6months of age were screened and1194 enrolled in the study. Of these 120 children died in hospital and were excluded from this particular study, leaving 1074participants who were considered for this study.

3.5.1 Inclusion and exclusion criteria for Smart Discharges

All children under6 months of age admitted with a proven or suspected infection who provided consent were enrollmentin the Smart Discharges study. Whether or not a patient had a suspected or proven infection were determined by the admitting health care professional in each case. Subjects already enrolled in the study were not eligible to be enrolled during subsequent admissions (i.e., a subject cannot be enrolled more than once). Provision of informed consent was a criterion for enrollment. For this particular study children who died in the hospital were excluded from the study.

3.6 Data Collection Instruments

Data was extracted from that collected by Smart Discharges project.Smart discharges team used a survey embedded on a software on a tablet. Due to the complex nature of a large multi-center study, data was collected using an electronic data collection form using REDCap (research Electronic Data Capture). All data entered into the mobile application was stored in an encrypted database using the encryption cipher Rabbit. Access to the tablet and the application was secured by passwords; without using the application, the encrypted files are not readable. Encrypted data was stored for less than a day on the tablets and was directly uploaded daily over a secured internet connection to the central study server.REDCap is a secure web-based application designed to support data capture for research studies. Each subjectwas given a unique number and all data was connected to this unique number.

3.7 Data Collection Procedures

For this study, the variables of interest were extracted from the original data collected by Smart Discharges project. The procedure of data collection by smart Discharges is described in detail; the parent or legal guardian(s) of participants meeting inclusion criteria were approached by a trained research nurse upon admission of their child in the hospital. Written informed consent was obtained from the parents or guardians of eligible participants. The parents voluntarily signed and dated the consent form if they wished to participate in the study and were then provided with a copy of the consent form. A signed and dated copy of the consent form was kept in the documentation file at all times. All participants were aware of the study rationale, as well as any potential risks. The consent form made it clear that standard care wasnot going to be compromised if children and their guardians did not consent to participate in this study. Following enrollment, a research nurse would obtain and record clinical and demographic variables required for model validation. These include vital signs, oxygen saturation, anthropometric data, prior care seeking, co-morbidities and diagnoses. A rapid diagnostic test using blood, which required a finger prick to collect < 0.5ml of blood, was conducted to assess the patient's HIV status, parasitemia, lactate, and hemoglobin. The study research nurse would then fill the survey during admission and also record some information at discharge.A project manager was working full-time to ensure the quality of all data collected.

3.8 Variables of the study

The Smart Discharges team collected data on over 150 factors but for this study we considered about 45 risk factors associated with DAMA. The independent variables of the studyincluded gender of primary caregiver and child, Education level of the caregiver, Current marital status of primary caregiver, means of transport to the hospital, Time taken to travel to the hospital, Weight WFA_Zscores and tablet oxygen saturation (measure). The dependent variable was DAMA. This variable has two categories: Yes (Discharged Against Medical Advice) and No (Routine discharge).

3.9Data analysis

The data analysis involved processing of the data which was done at three levels using Statistics/Data Analysis (STATA)version 13.

3.10 Ethical Considerations

Approval to conduct the study was sought from the directorate of graduate studies, research, and innovations at Bishop Stuart University. Further approval was sought from the principal investigator for permission to use part of the data collected by the Smart DischargesProject. Prior to the commencement of the original study, Smart discharges project obtained approval from the MUST Research ethics committee(No. 15/10-16) following administrative clearance from the hospital directors of Mbarara Regional Referral Hospital and Holy Innocents children Hospital. They further obtained approval from the Research ethics committee at the University of British Columbia(H16-02679)in Canada and obtained a registration permit from the Uganda National Council of Science and Technology(HS 2207). Written informed consent were obtained each from participants before enrolment. Members of the study team ensured that the rights of subjects and confidentiality of data was protected and respected. During data collection, interviews and examinations were held in private. No information that disclosed the identity of participants was released or published without their specific consent to the disclosure. However, research records and medical records identifying participants were inspected in the presence of the Investigator or his or her designate by representatives of the MUST Research Ethics Committee for the purpose of monitoring the research. No records which identified the participants by name or initials were allowed to leave the Investigators' offices.

RESULTS

4.0 Study participants

At these 2 hospitals a total of 2916 participants under 6 months of age were screened and 1194 enrolled in the study. Of these 120 children died in hospital and were excluded from this particular study, leaving 1074 participants who were considered for this study.

4.1 Prevalence of DAMA

At the two hospitals a data of 1074 participants under 6 months were considered for this study. Of these, 529 and 545 children were admitted at MRRH and HICH respectively.Results in table 4.1 reveal that the overall prevalence of DAMA was 110(10.2%). Stratified by the study areas, the prevalence of DAMA among patients admitted at MRRH was 58(11%) while for patients admitted at HICH was 52(10%).

4.2 Causes of admission among children discharged against medical advice in MRRH and HICH

Table 4.2 shows the disease conditions associated with DAMA. The most common conditions for admitted children who were DAMA had sepsis 53(36.81%), Pneumonia;24(16.67%) and Meningitis/encephalitis or other CNS infection; 16(11.11%). These same conditions were common among patients who were not

discharged against medical advice / followed routine discharge i.e. sepsis; 484(41.47%) Pneumonia;210(17.99%) and Meningitis/encephalitis or other CNS infection; 71(6.08%).

4.3. Socio-demographic and Socio-economiccharacteristics of children under 6 months admitted with infections to Mbarara Regional Hospital and Holy Innocents Childrens' Hospital

The results in the table 4.3 indicated that there were 110 (10.2 %) cases of DAMA out of 1074 children admitted with infections. Of the children admitted, 604 (56.2%) of them were male, while 470(43.8%) were female. Their modal age was <1-month, median age was 0.8 month, mean age 1.43 months with standard deviation of 1.43 months.

Of the patients who discharge against medical advice, 41(71%) and 32(62%) were male admitted at MRRH and HICH respectively. Looking at the mothers age, majority of the mothers 45(82%) of children who were DAMA were in the 20-30 age group at MRRH where as those at HICH in a similar age group were 44(87%). This age group was observed in mothers whose children were not DAMA at both hospitals.

Mothers' level of education differed by facility, 35(60%) had completed primary, 18(31%) secondary and only 5 (9%) had completed post-secondary at MRRH whereas at HICH, 18(35%) had completed primary, 14(27%) secondary and 20 (38%) had completed post-secondary. In terms of travel time to hospital, 18(31%) and 15(29%) spend less than 30 minutes to travel to hospital, 15(26%) and 16(31%) spent 30 minutes to 1 hour while 24(43%) and 21(36%) spent more than an hour to travel to hospital at MRRH and HICH respectively.

In terms of means of transport to hospital, the highest number of patients used motorcycles 24(24%) and taxi/special hire 23(40%) at MRRH whereas at HICH those who used motorcycles and taxi/ special hire were 23(44%) and 24(46%) respectively. When mothers were asked about sleeping under a mosquito net, a significant number 48(83%) and 45(87%) reveled that they always slept under the mosquito net.

4.4. Clinical factors distributions of patients admitted with infections to Mbarara Regional Hospital and Holy Innocents Children's Hospital

As regards to clinical factors, patients who were admitted at MRRH and were DAMA, had the following characteristics. Looking at WFA_Z score a significant number of patients, 35(60%) had Z score of >-2, 32(55%) had an axillary temperature of 37.5-39°C, average length of admission was 3-5 days for both DAMA and non DAMA patients, 39(67%) had oxygen saturation of above 94%, 38(66%) had a hemoglobin level of above 11g/dl and 47(81%) were not in respiratory distress. Furthermore, the highest number of admitted children were attended to by their mothers 53(91%) who were HIV negative 45(78%).

In addition, the patients at HICH had the following characteristics. Looking at WFA_Z score a significant number of patients 42(81%), had Z score of >-2, 25(48%) had an axillary temperature of 36-37.5°C, 34(65%) had oxygen saturation of above 94%, 40(77%) had a hemoglobin level of above 11g/dl and 42(81%) were not in respiratory distress. Furthermore, the highest number of admitted children were attended to by their mothers 51(98%) and majority of mothers were HIV negative 40(78%).

4.4 Factors associated with the DAMA among children under six admitted with infections at MRRH and HICH.

4.4.1 Bivariate logistic regression analysis.

This section represents the association of clinical factors, socio-demographic and socio-economic to DAMA amongst patients admitted with infections at MRRH as shown intable 4.

Among socio-demographic and socio-economic factors, travel time to hospital for 1-2 hours at Unadjusted Odds Ratio(UOR); (UOR=2.19; 95%CI(1.1-4.5; p=0.029) was statistically significant.Patients who spent 1-2 hours traveling to Mbarara Regional Referral hospital were more than 2 times more likely to discharge

against medical advice compared to their counterparts who spent less than 30 minutes travelling to the hospital. Additionally, among the clinical factors, HIV status stood out as a key marker associated with DAMA. Patients whose mothers were HIV positive were more than 45 times more likely to leave against medical advice compared to patients whose mothers were HIV negative (UOR = 45.1, 95% CI: 12.4-16.41, p =<0.001). Children withaxillary temperature of 39^0C and above were 82% less likely to discharge against medical advice compared to those whose axillary temperature was less than 36^0c (UOR = 0.18, 95% CI: 0.08 – 0.95, p = 0.043).

Similarly these factors were statistically significant among patients admitted at Holy Innocents Children's hospital as shown in table 4.4b, Discharge against Medical Advice was significantly associated with the time spent traveling to the hospital among the clinical factors. Thus patients who spent more than two hours traveling to the hospital were 73% less likely to discharge against medical advice compared to their counterparts who spent less than 30 minutes, (UOR = 0.27, 95% CI: 0.08-0.95, p = 0.043). Among the clinical factors, findings from the model indicate that the mother's whose HIV status was positive were 13.2 times more likely to discharge against medical advice compared to children whose mother'swere HIV negative(UOR = 13.2, 95% CI:5.3-33.2, p <0.001).

Summary Bivariate analysis

The section focused on determining the association between the Discharge Against Medical Advice among children admitted to two hospitals in Mbarara city with infections and the socio-demographic and socio-economic and clinical factors. It presents the bivariate analysis results carried out using logistic regression analysis presenting the unadjusted/ crude estimates. The bivariate analysis showed that the Discharge Against Medical Advice is associated with time spent traveling to hospitals, Maternal HIV status and axillary temperature. Other factors were not significantly associated with DAMA as demonstrated in (tables 4.4a & 4.4b).

4.5 Multivariate logistic regression analysis

Multivariate analysis was performed to assess which factor associated with Discharge against Medical Advice more than the other. The section presents the multivariate analysis results that were carried out using the multivariable logistic regression. At a multivariate level, all factors which had p-values below the threshold of 0.05 at the bivariate analysis were included in the multivariate model (Table 4.5). A reference category was selected for each categorical variables.

The multivariate analysis showed that patients who were admitted at MRRH and whose mother HIV status was positive were 4.4 times more likely to discharge against medical advice compared to patients whose mothers' HIV status was negative Adjusted Odds Ratio (AOR) (AOR=4.4; 95%CI(11.3-15.9)**;** p<0.001) among the clinical variables.Furthermore, Patients admitted at MRRH who had axillary temperature 36-37.5 were 76% less likely to discharge against medical advice compared to patients who had temperature <36^0c (AOR=0.24; 95%CI(0.06-0.99)**;** p<0.050). Results revealed that patients who had axillary temperature of ≥39^0c were 82% less likely to discharge against medical advice compared to patients who had temperature <36^0c (AOR=0.18; 95%CI (0.03 - 0.95); p=0.044).

The multivariate analysis further revealed that Patients who were admitted at HICH and whose mothers' were HIV positive was statistically significant with discharge against medical advice. Patients whose mothers were HIV positive were 9 times more likely to discharge against medical advice compared to their counterpart who were negative (AOR = 8.9; 95%CI(6.8 – 25.8); p<0.01) while among the social demographic and social factors, patients who spent more than 2 hours traveling to the hospital were 74% less likely to discharge against medical advice compared to those who spent less than 30 minutes (AOR = 0.26; 95%CI(0.06 – 0.99); p=0.049). Other factors were not significantly associated with DAMA as demonstrated in (table 4.5).

5.2 Discussion

5.2.1 Prevalence of DAMA

The prevalence of DAMA was 10.2%. Stratified by the study areas, the prevalence of DAMA among patients admitted at MRRH was 58(11%) while for patients admitted at HICH was 52(10%). These rates fall within the range found out from other studies carried out in a similar setting looking at pediatric in-hospital death from infectious disease in Uganda: Derivation of clinical prediction by Lowlaavar et al., (2016) where prevalence of DAMA was at 9.7%. The high prevalence may be attributed to the high costs associated with hospitalisation. A study carried out by Atwiine et al., (2019) to understand the reason for abandoning treatment by children with cancer revealed that financial constraint was the major reason for abandoning cancer treatment where care givers reported that they struggled to raise money to buy food and other necessities during hospitalisation.

5.2.2 Socio-demographic and socio-economic

Among the DAMA cases, most children that experienced DAMA were male. These findings conquer with those found out by Ndu (2016) & Abbas (2017) in their studies carried out to find out reasons why children leave against medical advice. These results bear similarity with this study where males constituted 66% of self-discharged babies. Male predominance may be because of gender bias towards baby boys, as a result of which more boys are brought for admission. Also, boys are more susceptible to infections and premature death due to differences in genetic and biological make up which results in their higher admission rate.
Furthermore Youssef (2012) investigated the factors associated with discharge against medical advice in a Saudi teaching hospital. In the study findings, the distance of residence from the hospital was associated with DAMA. The results showed that 72.1% of respondents lived 615 km away from the hospital while 27.9% lived 15km away from the hospital. Findings from this study however, reveal that patients who spent less than 30 minutes traveling to hospital were more likely to DAMA than those that stayed far / spent a longer time travelling to hospital.

5.2.3 Clinical factors

Among the patients admitted at these hospitals, the commonest diagnoses were neonatal sepsis and Pneumonia. A similar pattern was reported by Ndu in 2016 and Opara and Eke, 2009. According to Annis (2002) and Albayati et al., (2021) in their studies of centre for excellence in HIV/AIDS and why patients leave against medical advice respectively, found out that patients who were HIV positive were lively to leave against medical advice. The findings are in agreement with finds from this study where mothers who were HIV positive were more likely to leave against medical advice. This can be attributed to the fact that these mothers once at the admission facility, they usually face challenges in accessing HIV care such as picking their ARVs drugs and opt for DAMA. These 2 hospitals are referral centres in the region and may not be the facilities where mothers usually obtain HIV care from.

5.2 Limitations

This study did not collect the reasons patients left against medical advice, making it hard to understand their decision. Further research studies can be carried out to address this.

5.3 Conclusions

Maternal HIV status, temperature and distance from facility to home were highy associated with discharge against medical advice. Understanding the specific populations at a higher risk of DAMA may provide insights into aspects of health services that need to be addressed to improve quality of care for all patients.

Figures and Tables of results

4.0 Study participants

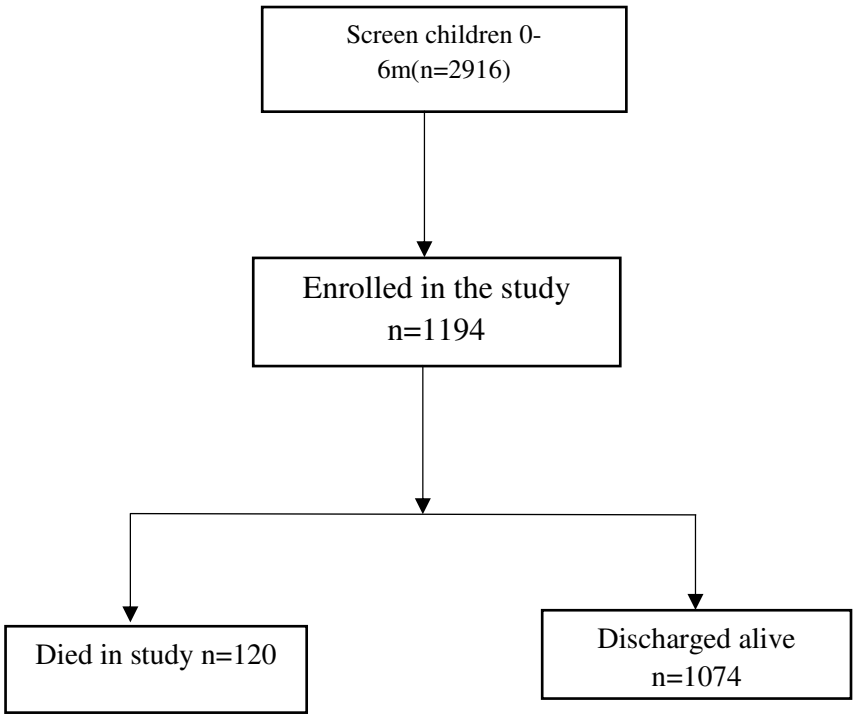

Figure 1 showing study participants

Table 4.1 Prevalence of discharge against medical advice by study areas

Study area	**Discharge status**		
	Routine discharge n(%)	DAMA n(%)	Total
MRRH	471(89.04)	58(10.96)	529(100.0)
HICH	493(90.46)	52(9.54)	545(100.0)
Total	964(89.76)	110(10.24)	1,074(100.0)

Table 4.2. Causes of admission among children discharged against medical advice in MRRH and HICH

Discharge Diagnosis in admitted children	Discharge Against Medical Advice	Routine discharge
	n(%)	n(%)
Malaria	02(1.39)	28(2.40)
Pneumonia	24(16.67)	210(17.99)
Sepsis	53(36.81)	484(41.47)
URTI	03(2.08)	33(2.83)
Gastroenteritis/diarrhea	04(2.78)	51(4.37)
Meningitis/encephalitis or other CNS infection	16(11.11)	71(6.08)
Malnutrition	10(6.94)	26(2.24)
Measles	02(1.39)	14(1.20)
Other - Infection	30(20.83)	250(21.42)
Total	**144(100.00)**	**1167(100.00)**

Note: These were multiple responses

Table 4.3Socio-demographic and Socio-economic distribution of the patients by study area.

Characteristics	category	MRRH	
		Routine dischargen(%)	DAMAn(%)
Gender	Male Female	272(57.75) 199(42.25)	41(70.69) 17(29.31)
Mothers age	<20 20-30 >30	24(5.12) 335(71.28) 111(23.72)	3(5.45) 45(81.82) 7(12.73)
Education level of the	Primary Secondary	255(54.49) 149(31.84)	35(60.34) 18(31.03)

mother	Post -Secondary	64(13.68)	5(8.62)
Travel time to hospitals	<30 min 30 min-1 hr 1-2 hrs >2 hrs	207(43.95) 118(25.05) 89(18.90) 57(12.10)	18(31.03) 15(25.86) 17(29.31) 8(13.79)
Means of transport to hospitals	Ambulance Motorcycle Private vehicle Taxi/special hire Walking	12(2.55) 255(54.14) 49(10.40) 149(31.63) 06(1.27)	03(5.26) 24(42.11) 06(10.53) 23(40.35) 01(1.75)
Sleep under a mosquito net?	Never Always Sometimes	32(6.79) 408(86.62) 31(6.58)	05(8.62) 48(82.76) 05(8.62)

Table 4.4 Clinical factors' distributions of the patients by study area. study area.

Characteristics	**category**	**MRRH**		**HICH**	
		Routine discharge n(%)	**DAMA n(%)**	**Routine discharge n(%)**	**DAMA n(%)**
WFA_Z score: Weight for age Z score	<-3 -3 to -2 >-2	52(11.04) 48(10.19) 371(78.77)	10 (17.24) 13(22.41) 35(60.34)	68(13.82) 50(10.16) 374(76.02)	8(15.38) 2(3.85) 42(80.77)
Maternal HIV status	Negative Positive	468(99.36) 03(0.64)	45(77.59) 13(22.41)	483(97.9) 10(2.03)	40(78.43) 11(21.57)
Axillary temperature (Celsius)	<36 36-37.5 37.5-39 >=39	08(1.70) 185(39.28) 218(46.28) 60(12.74)	3(5.17) 19(32.76) 32(55.17) 4(6.90)	17(3.45) 271(54.97) 166(33.67) 39(7.91)	03(5.77) 25(48.08) 22(42.31) 02(3.85)
Tablet SpO2	<90 90-94 >94	93(19.79) 99(21.06) 278(59.15)	10(17.24) 09(15.52) 39(67.24)	84(17.07) 122(24.80) 286(58.13)	08(15.38) 10(19.23) 34(65.38)
Length of admission (days)	<3 3-5 >5	51(10.83) 217(46.07) 203(43.10)	02(3.45) 24(43.10) 31(53.45)	101(20.49) 262(53.14) 130(26.37)	12(23.08) 22(42.31) 18 (34.62)
Hemoglobinlevel (g/dl)	<7 7-11 >11	18(3.83) 98(20.85) 354(75.32)	3(5.17) 17(29.31) 38(65.52)	12(2.43) 73(14.81) 408(82.76)	00(0.00) 12(23.08) 40(76.92)
severe respiratory	Yes No	92(19.53) 379(80.47)	11(18.97) 47(81.03)	114(23.12) 379(76.88)	10(19.23) 42(80.77)

distress					

Table 4.4a: Bivariate analysis results of factors associated with DAMA among children under six admitted at MRRH (n = 529)

Characteristics	**category**	**MRRH**			
		Routine discharge n(%)	**DAMA n(%)**	**UOR(95%CI)**	**P-value**
Gender	Male Female	272(57.75) 199(42.25)	41(78.85) 17(32)	1 0.56(0.31-1.02)	 0.061
Mothers age	<20 20-30 >30	24(88.89) 335(88.16) 111(94.07)	3(5.77) 45(86.54) 7(13.46)	1 1.41(0.57-3.51) 0.49(0.23-1.05)	 0.462 0.066
Education level of the mother	Primary Secondary Post -Secondary	255(54.49) 149(31.84) 64(13.68)	35(60.34) 18(31.03) 5(8.62)	1 0.88(0.48-1.61) 0.57(0.21-1.51)	 0.678 0.258
Travel time to hospitals	<30 min 30 min-1 hr 1-2 hrs >2 hrs	207(43.40) 118(24.74) 89(18.66) 57(11.95)	18(8.00) 15(11.28) 17(16.04) 8(12.31)	1 1.46(0.7-3.0) 2.19(1.1-4.5) 1.61(0.67-3.9)	 0.302 **0.029*** 0.288
Means of transport to hospitals	Ambulance Motorcycle Private vehicle Taxi/special hire Walking	12(80.00) 255(91.40) 49(89.09) 149(86.63) 6(85.71)	3(20.00) 24(8.60) 6(10.91) 23(13.37) 1(14.29)	1 0.37(0.1-1.43) 0.48(0.1- 2.25) 0.62(0.16-2.35) 0.67(0.06-7.85)	 0.151 0.358 0.480 0.747
WFA_Z score:	<-3 -3 to -2 >-2	52(11.04) 48(10.19) 371(78.77)	10 (17.24) 13(22.41) 35(60.34)	1 1.41(0.57-3.51) 0.49(0.23-1.05	 0.462 0.066
Maternal HIV status	Negative Positive	468(99.36) 3(0.64)	45(77.59) 13(22.41)	1 45.1(12.4-164.1)	 **0.000***
Axillary temperature (Celsius)	<36 36-37.5 37.5-39 >=39	8(1.70) 185(39.28) 218(46.28) 60(12.74)	3(5.17) 19(32.76) 32(55.17) 4(6.90)	1 0.27(0.06-1.12) 0.39(0.1- 1.55) 0.18(0.03-0.94)	 0.072 0.182 **0.043***
Tablet SpO2	<90	93(19.79)	10(17.24)	1	

	90-94 >94	99(21.06) 278(59.15)	9(15.52) 39(67.24)	0.84(0.32-2.17) 1.30(0.62- 2.73)	0.727 0.477
Sleep under a mosquito net?	Never Always Sometimes	32(6.79) 408(86.62) 31(6.58)	5(8.62) 48(82.76) 5(8.62)	1 0.75(0.28-2.0) 1.03(0.27-3.92)	 0.574 0.963
Length of admission (days)	<3 3-5 >5	51(10.83) 217(46.07) 203(43.10)	2(3.45) 24(43.10) 31(53.45)	1 2.9(0.67-12.8) 3.9(0.90- 16.8)	 0.151 0.068
Hemoglobin level (g/dl)	<7 7-11 >11	18(3.83) 98(20.85) 354(75.32)	3(5.17) 17(29.31) 38(65.52)	1 1.04(0.27-3.92) 0.64(0.18- 2.29)	 0.953 0.496
severe respiratory distress	Yes No	92(19.53) 379(80.47)	11(18.97) 47(81.03)	1 1.03(0.52-2.1)	 0.918

Table 4.4b: Bivariate analysis results of factors associated with DAMA among children under six admitted at HICH (n = 545)

Characteristics	**category**	**HICH**			
		Routine discharge (%)	**DAMA n(%)**	**UOR(95%CI)**	**P-value**
Gender	Male Female	259(53.18) 234(48.05)	32(11.00) 20(7.87)	1 0.69(0.38-1.24)	 0.218
Mothers age	<20 20-30 >30	43(97.73) 327(88.14) 122(95.31)	1(2.27) 44(11.86) 6(4.69)	1 0.34(0.06-1.67) 0.95(0.42-2.12)	 0.184 0.909
Education level of the mother	Primary Secondary Post - Secondary	220(44.62) 138(27.99) 135(27.38)	18(34.62) 14(26.92) 20(38.46)	1 1.24(0.6-2.57) 1.81(0.92-3.55)	 0.564 0.083
Travel time to hospitals	<30 min 30 min-1 hr 1-2 hrs >2 hrs	124(89.21) 140(89.74) 137(88.39) 92(96.84)	15(10.79) 16(10.26) 18(11.61) 3(3.16)	1 0.94(0.45-1.99) 1.1(0.52- 2.25) 0.27(0.08-0.95)	 0.881 0.824 **0.043***
Means of	Ambulance	5(100.00)	0(0.00)	1	

transport to hospitals	Motorcycle Private vehicle Taxi/special hire Walking	181(88.73) 32(91.43) 268(91.78) 7(77.78)	23(11.27) 3(8.57) 24(8.22) 2(22.22)	0.44(0.09-2.27) 0.33(0.05-2.35) 0.31(0.06-1.59) 0.29(0.06-1.38)	0.330 0.267 0.162 0.118
WFA_Z score:	<-3 -3 to -2 >-2	68(13.82) 50(10.16) 374(76.02)	8(15.38) 2(3.85) 42(80.77)	1 0.34(0.07-1.67) 0.95(0.42-2.12)	 0.184 0.909
Maternal HIV status	Negative Positive	483(97.9) 10(2.03)	40(78.43) 11(21.57)	1 13.2(5.3-33.2)	 **0.000***
Axillary temperature (Celsius)	<36 36-37.5 37.5-39 >=39	17(3.45) 271(54.97) 166(33.67) 39(7.91)	3(5.77) 25(48.08) 22(42.31) 2(3.85)	1 0.52(0.14-1.91) 0.75(0.20-2.78) 0.29(0.04-1.90)	 0.326 0.667 0.197
SpO2 from other device	<90 90-94 >94	84(17.07) 122(24.80) 286(58.13)	8(15.38) 10(19.23) 34(65.38)	1 0.86(0.33-2.27) 1.25(0.56-2.8)	 0.762 0.591
Sleep under a mosquito net?	Never Always Sometimes	48(9.74) 423(85.80) 22(4.46)	7(13.46) 45(86.54) 0(0.00)	1 0.73(0.31-1.71) 0.14(0.06-1.32)	 0.467 0.480
Length of admission (days)	<3 3-5 >5	101(20.49) 262(53.14) 130(26.37)	12(23.08) 22(42.31) 18 (34.62)	1 0.71(0.34-1.48) 1.17(0.54-2.53)	 0.358 0.699
Hemoglobin level (g/dl)	<7 7-11 >11	12(2.43) 73(14.81) 408(82.76)	0(0.00) 12(23.08) 40(76.92)	1 1.6(0.84-3.35) 0.1(0.07-1.14)	 0.143 0.158
severe respiratory distress	Yes No	114(23.12) 379(76.88)	10(19.23) 42(80.77)	1 1.26(0.61-2.6)	 0.525

***Statistically significant (p<0.05) at bivariate analysis**

Table 4.5: Multivariable analysis results of factors associated with Discharge against Medical Advice among children less than six admitted at MRRH & HICH, Mbarara district

Characteristics	**category**	**MRRH**			
		Routine discharge n(%)	**DAMA n(%)**	**AOR(95%CI)**	**P-value**

Travel time to hospitals	<30 min 30 min-1 hr 1-2 hrs >2 hrs	207(43.94) 118(25.05) 89(18.89) 57(12.10)	18(31.03) 15(25.86) 17(29.31) 08(13.80)	1 1.65(.76-3.58) 1.87(0.83- 4.21) 1.59(.60- 4.16)	 0.206 0.130 0.349
Maternal HIV status	Negative Positive	468(99.36) 3(0.64)	45(77.59) 13(22.41)	1 4.4(11.3- 15.9)	 **0.000****
Axillary temperature (Celsius)	<36 36-37.5 37.5-39 >=39	08(1.70) 185(39.28) 218(46.28) 60(12.74)	03(5.17) 19(32.76) 32(55.17) 04(6.90)	1 0.24(0.06 - 0.99) 0.30(0.07 - 1.26) 0.18(0.03 - 0.95)	 **0.050**** 0.100 **0.044****
HICH					
Travel time to hospitals	<30 min 30 min-1 hr 1-2 hrs >2 hrs	124(25.15) 140(28.39) 137(27.79) 92(18.66)	15(28.85) 16(30.77) 18(34.62) 03(5.77)	1 1.53(0.67 - 3.48) 1.32(0.58 - 3.03) 0.26(0.06 - 0.99)	 0.317 0.508 **0.049**
Maternal HIV status	Negative Positive	483(97.9) 10(2.03)	40(78.43) 11(21.57)	1 8.9(6.8-25.8)	 **0.000****
Axillary temperature (Celsius)	<36 36-37.5 37.5-39 >=39	17(3.45) 271(54.97) 166(33.67) 39(7.91)	3(5.77) 25(48.08) 22(42.31) 2(3.85)	1 0.36(0.09 - 1.41) 0.51(0.12 - 2.03) 0.21(0.03- 1.42)	 0.144 0.340 0.109

** Statistically significant ($p<0.05$) at multivariate analysis

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