Experiences in the care of malaria infected children in a pediatric inpatient ward in Tanzania

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SAMMANFATTNING

**Bakgrund:** Av tusen barn som föds i Tanzania dör sexton av malaria. Trots att förbättringar skett inom pediatrisk maliariavård återstår fortfarande många utmaningar.

**Syfte:** Syftet med studien var att undersöka vilka erfarenheter och uppfattningar som sjuksköterskor och anhöriga till barn infekterade med malaria har gällande pediatrisk maliariavård vid Kilimanjaro Christian Medical Centre i Tanzania.

**Metod:** Semistrukturerade intervjuer utfördes bland tre sjuksköterskor och tre anhöriga till barn med malaria på en pediatrisk vårdavdelning vid Kilimanjaro Christian Medical Centre i Tanzania. Intervjuerna spelades in, transkriberades och därefter analyserades med innehållsanalys.

**Resultat:** Den största utmaningen i vården av maliariainfekterade barn ansåg sjuksköterskorna vara bristen på kunskap om sjukdomen hos de anhöriga vilket ansågs vara andledningen till bristande följsamhet gällande prevention. Även de anhöriga uttryckte bristen på kunskap om malaria och de önskar mer utbildning. De ansåg även att arbetsbelastningen på avdelningen var stor för sjuksköterskorna. Tillgången för barnet att få vård berodde på huruvida den anhöriga var från landsbygden eller staden.

**Slutsats:** För att fortsatta kampen mot malaria bland barn är det av stor vikt att öka de anhörigas kunskap om malaria, minska personalens arbetsbelastning, samt förbättra tillgängligheten av sjukhus inom landet.

**Nyckelord:** Tanzania, pediatrisk maliariavård, sjuksköterskor, anhöriga
ABSTRACT

**Background:** The number of children under the age of five who dies of malaria per thousand births is sixteen in Tanzania. Even though improvements have been made there are still many challenges in the care of malaria infected children.

**Aim:** The aim of this study was to investigate the experiences that nurses and relatives to malaria infected children have regarding the pediatric malaria care at Kilimanjaro Christian Medical Centre, Tanzania.

**Method:** Semi structured interviews were conducted among three nurses and three relatives to malaria infected children within a pediatric ward at Kilimanjaro Christian Medical Centre, Tanzania. The interviews were recorded, transcribed and then analysed.

**Result:** All the nurses agreed that the major challenge in the care of malaria infected children is the lack of knowledge from the relatives about prevention of malaria. This results in a lack of adherence among the relatives concerning prevention. The relatives agreed about their lack of knowledge about malaria and they wished for more education. They also considered the workload to be an issue for the nurses at the ward. The availability for the child to get treatment depends whether they are from a rural area or city.

**Conclusion:** To continue the fight against malaria among children it is of great importance to focus on the relatives lack of knowledge about malaria, the workload issue and the long distance to hospital.

**Key-words:** Tanzania, pediatric malaria care, nurses, relatives
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1. INTRODUCTION

1.1 Malaria

Malaria is the disease that causes the most deaths worldwide. In 2010, malaria caused about 650,000 deaths globally, among these many children. Every minute a child dies of malaria in Africa and 22 percent of all deaths in children worldwide are caused by this infection. The disease is caused by infected mosquitoes that transmit the infection to humans by the bite. The symptoms are characterized by fever, vomiting, shaking and sweating. These symptoms are later followed up, if not treated, with complication such as respiratory distress syndrome, severe anaemia, acute septic malaria and disseminated intravascular coagulation. These conditions may therefore resolve in death (WHO, 2011). Malaria can also affect the central nerve system in two different ways. Severe cerebral malaria manifests itself as encephalitis due to obstruction of the capillaries of the brain. This is a very serious condition and can be fatal. A less severe cerebral impact can be seen in the patient in terms of confusion and hallucinations (Spicer, 2008).

According to Rombo (2011), the typical clinical picture at onset of malaria can be divided into three different stages. Starting with the cold stage then the hot stage and ends with the wet stage. During the cold stage the patient suffers from severe chills. Lip cyanosis and reduced peripheral circulation can be seen as a result of vasoconstriction. After an hour the patient goes into the hot stage with high temperature, 39-41 ° C, along with headaches and nausea occurs. Vasoconstriction stops and turns to a vasodilation. The patient becomes highly red faced and feel scorching. A few hours later the patient is suffering from excessive sweating and a rapid fall in temperature. This is the wet stage. The following day the patient may feel asymptomatic but falls ill later, again with a worsening of symptoms.

1.2 The parasite

The course of the disease depends on multiple factors such as the kind of parasite, climatic conditions and the human host. A high temperature and high humidity benefits the
development of the parasite in the mosquito and therefore an ultimate climatic condition for the parasite can be found in Africa, south of Sahara (Rombo, 2011).

There are five different species of the parasite, Plasmodium Falciparum, Plasmodium Vivax, Plasmodium Ovale, Plasmodium Malariae and Plasmodium Knowlesi but the most common species is Plasmodium Falciparum. This parasite is spread by the female Anopheles mosquito and causes most deaths from malaria (Fairhurst & Wellems, 2010). Anopheles mosquito injects the parasite into humans through their saliva in the bite. The parasite infects human liver cells and develops into liverschizonts, meaning malaria infected liver cells. A liverschizont may contain up to 30 000 daughter parasites. When the infected liverschizont cracks it infects the human erythrocytes with its daughter parasites. During 24-72 hours the daughter parasite develops an erytrocytschizont, meaning malaria infected erythrocyt. When this in turn cracks an amount of pyrogens is excreted and then symptoms start to develop. The parasite, P. falciparum, invades all erythrocytes in any development stage they are in. This provides a more aggressive clinical picture than the other plasmodium species. When an infection caused by P. falciparum, more than half of all erythrocytes in the body can be parasitized (White, 2009).

1.3 Prevention and treatment

The World Health Organisation has established guidelines for treatment of malaria and from 2003 and forward, Tanzania started to adopt these guidelines on treatment and prevention of malaria. Since then a notable reduction regarding infant mortality from malaria is seen. It is also noticed a decrease in the number of children who become ill with malaria (World malaria report, 2010).

To prevent malaria it is important to control the spread of the vector, meaning the mosquito. There are different courses of action to do this such as using insecticide treated mosquito nets, indoor residual spraying with insecticides and avoiding to get bitten. A study from sub-Sahara shows that with the help of mass distribution of insecticide treated mosquito nets along with information, a significant decrease in the prevalence of P. falciparum is shown among children under the age of five. The study determines that the use of insecticide treated mosquito nets is increasing along with motivation and information and therefore a reduction of
malaria prevalence is shown (Koudou et al., 2010). WHO recommends that pregnant women living in highly exposed areas should receive preventive medication during the second and third trimester. This applies even for infants who are located in high-exposed areas in Africa and the medication should be done in conjunction with the routine vaccination programme. From 2012 and forward, WHO recommend that all children under the age of five should be treated monthly with malaria prevention medicine. This should be done during the season when children are as most exposed and the prevalence of infectious mosquitoes is at the highest level (WHO, 2011). Research is constantly striving to develop a vaccine against malaria but it has not yet established an effective vaccine against malaria. WHO (2010) has in recent years recommended that the primary treatment for malaria is the artemisinin-based combination therapy (ACTs) when the parasites developed a resistance to drugs as chloroquine phosphate. They have also developed a test, rapid diagnostic test (RDT), a blood test that shows if you are infected with the malaria parasite. This has resulted in a faster treatment to those in need, and the treatment is not given in vain to those who are not infected. This results in a reduced risk for development of resistance (WHO, 2010).

According to Bhattarai and colleagues (2007), it may be possible to nearly eliminate the incidence of malaria with the help of ACT treatment and insecticide treated mosquito nets. This is demonstrated in their study in Zanzibar, Tanzania, where there was free ACT treatment available and insecticide treated mosquito nets were offered to pregnant women and children under five. This resulted in a decrease of 52 percent in mortality from malaria among children under five.

1.4 The incidence of malaria in Tanzania

The incidence of malaria in Tanzania in 2010 is estimated at 8.75 million (WHO, 2011). A study in north-eastern Tanzania showed that by introducing easily accessible antimalarial drugs, the prevalence of malaria infected villagers reduced from 78% to 13% in a period of five years. This reduction depends on a variety of factors such as improved access to treatment, trained health workers, protection from mosquitoes by using bed nets and also by reducing the density of the mosquitoes (Mmbando et al., 2010). In Tanzania, the government provide a free mosquito net to every family.
The number of children under the age of five who die of malaria per thousand births is sixteen in Tanzania (Gapminder, 2008). Children under the age of five are an especially vulnerable group to suffer from malaria mostly because they have not yet developed a protective immune. In Tanzania it is shown that young children living in high-exposed areas are the ones that suffered most from high anemia burden which most likely is caused by malaria (Wiwanitkit, 2007). Carneiro and colleagues (2010) state that the younger children are the ones who are most vulnerable to being infected by P. falciparum. Because of this, strategies to prevent and treat malaria should be prioritized in this age group to reduce mortality in sub-Saharan Africa. According to Okpere and colleagues (2010) malaria is the main factor for pregnancy complications in sub-Saharan Africa. Malaria cause serious complications during pregnancy, such as growth restriction, low birth weight, prematurity, fetal distress, congenital malaria and stillbirth. These complications put the newborns at a higher risk for mortality and to develop illness.

1.5 Obstacles and challenges

Despite many advances in treatment of malaria, there still exist many barriers to achieve a complete successful treatment and prevention. Maslow and colleagues (2009) present a summary of these barriers. Major barriers identified regarding the prevention of malaria were above all a lack of understanding of the cause and treatment of malaria. It has also been seen that many people believe that malaria is a disease that cannot be prevented. There are perceptions among people that the disease does not spread only by mosquitoes but also by bad food, unclean water, environmental and supernatural elements. Other barriers to prevention are that the symptoms of malaria are misjudged, where symptoms in especially children, such as convulsions and anemia were considered to be caused by witchcraft or other supernatural causes.

Barriers identified which affected the treatment of malaria, where especially a perception that children with convulsion may die of an injection. There is also a great fear of taking children to hospital. Furthermore, long distances and the costs were common barriers to receive treatment. Many studies show that the given treatment that is expected to continue at home often ends when the symptoms go away, since they want to save the expensive medicine to the next case of illness in malaria. It is demonstrated that the strong belief in traditional
medicine, such as healing methods, healers, herbal medicine and various forms of fumigation, were often preferred over pharmacotherapy. Cultural differences are also reported of having an impact on the outcome of malaria. Treatment and prevention must be undertaken with great respect and understanding of these cultural differences and perceptions that exist in order to improve the fight against malaria (Maslow et al., 2009).

1.6 Problem area

Improvements are being made regarding the development to control malaria, especially when considering the reduction in child mortality (World Malaria Report, 2010). However, there are still many obstacles and challenges in dealing with the prevention and treatment of malaria regarding pediatric inpatient care. Obstacles that can be identified within pediatric inpatient care are according to health workers, lack of educated staff, overcrowding and unsanitary conditions in the hospital (Mwangi et al., 2008). According to Mubyazi et al. (2010), factors that affect the mothers and pregnant women not seeking health care for the prevention and treatment of malaria are costs for malaria prophylaxis, long distances to clinics and long waiting time. These barriers result in the fact that mothers to children infected with malaria and pregnant women sometimes avoid seeking hospitalized care and therefore the children and the women will not get the early treatment, which is necessary for survival of malaria infection.

1.7 Aim of the study

The aim of this study was to investigate the experiences that nurses and relatives to malaria infected children have regarding the pediatric malaria care at Kilimanjaro Christian Medical Centre, Tanzania.
2. METHOD

2.1 Design

The study has a descriptive qualitative design by using interviews that are semi-structured. A qualitative design gives many advantages such as providing the study with a holistic approach by constantly striving for understanding the overall picture. It also provides flexibility by making it capable of adjusting the study along the way depending on the findings during the course of data collection. The type of qualitative research that was used is descriptive which allows the design to present the valuable reflections of individuals without tending to penetrate their data in any construed way (Polit, & Beck, 2008).

2.2 Sample

The sample group consisted of nurses and relatives to malaria infected children from a pediatric inpatient ward at Kilimanjaro Christian Medical Center, Tanzania. There are three different pediatric divisions at the hospital. This study took place at the medical division which admits all malaria infected children within the hospital. The ward consists of five rooms and they separate diseases from each other by having an own room for diarrhea and vomiting and another room for malaria, pneumonia and HIV. In each room there are beds for six up to ten patients. Every bed has its own bed net and some of the windows have nets. The maximum amount of patients within the medical division is sixty and there are two or three nurses working each shift.

The inclusion criteria for the nurses were that they were registered nurses, had worked at the pediatric ward for at least one year and were English speaking. This was to provide a fair overall picture of the ward. There were approximately six nurses working during the time this study was conducted. They were all informed about the study and requested to participate in the study. The number of nurses who participated in the study was in the end three. The reasons for the nurses who were excluded in the study were lack of language skills and unwillingness to be recorded. The nurses who were interviewed were all female and had a variation of work experience from one year up to forty-one years.
The selection criteria for the relatives included in this study was that the child would be between the age of six months and five years old, infected with malaria and hospitalized in the pediatric ward due to malaria. Since the relatives weren’t English speaking an interpreter was contacted and involved in the interviews. The aim was to interview five relatives, but because of few malaria admitted patients and severe condition of the child the number of relatives that were interviewed was three. They were informed all about the study by the help of an interpreter and gave their permission by signing the consent letter. The relatives relationship to the children infected with malaria varied, since the study included one grandmother, one father and one mother.

2.3 Data collection method

To collect information, semi structured interviews were used. Semi structured interviews are open-ended and for that reason provides an understanding to what the individual experiences (Polit, & Beck, 2008). The interview guide was developed by the authors after reading the literature and consisted of certain main topics. The main topics were followed-up by a number of questions related to the aim to receive more detailed information. The interviews were based on nurses and relatives to malaria infected children’s experiences of the care in a paediatric ward during the hospital stay.

The topics of the interview guide to the nurses were adherence regarding the guidelines for the treatment of malaria, the care environment, hygiene procedures, prevention of malaria, opinions regarding workload and their experience in drug administration (Appendix 3). The relatives interview guide were dealing with topics such as the attitudes they experience from the health workers in the ward, opinions regarding the treatment that their children receive, how available they experience health care to be, prevention against malaria, how they experience the environment at the ward and if this affects the care of their children (Appendix 4).

2.4 Procedure

The dean of school of nursing at Kilimanjaro Christian Medical Center gave an approval before this study was conducted. The participants in the study were recruited from the
Kilimanjaro Christian Medical Centre. A letter (Appendix 1) was handed out by the authors to the nurses in the ward who care children with malaria with information about the study and was signed if they wished to participate. The inscribed information letters were collected. When the letter was handed out oral information was also given about the study. The recruitment of the relatives also took place in the pediatric ward. Recruitment was done by the authors with the help of a translator by handing out the information letter (Appendix 2) and also verbal information about the study were given to relatives of children who are treated at the ward for malaria. The inscribed information letters were collected after they had read the letters. The interviews took place during the nurses work hours within the ward. A private area was used to ensure confidentiality. The interviews lasted approximately 15 – 20 minutes. A recorder was used and during the interview there were three people involved; the interviewer, the informant and an observant who took notes. During the interviews with the relatives an interpreter was also involved. Between the interviews the authors switched turn of being the observer and interviewer.

2.5 Processing and analysis

The semi structured interviews were audiotaped and then carefully transcribed. To avoid errors and to ensure the accuracy of the transcriptions, the recordings were listened and analyzed several times (Polit & Beck, 2008). The data was analyzed by using qualitative content analyses described by Granheim & Lundman (2004). By using this method the data is structured and concrete and therefor easy to follow. Information obtained at the transcription were then strictly quoted and categorized into meaning units. Then the quotations were interpreted and summarized into condensed meaning units. The next step was to code these condensed units of meaning, and then divide the codes into subthemes and then finally into themes. The data analysis was done by the authors of this thesis and constantly processed during the project period. Since there are two authors of this thesis it will reduce the risk of misinterpretation when both authors conducted the interception of the recorded interviews. The authors prior understanding about the disease malaria is basic, but in terms concerning the care of malaria, the authors have little prior understanding. An example of the content analyze is shown in table 1.
### Table 1. Example of meaning units, condensed meaning units, sub-themes and themes.

<table>
<thead>
<tr>
<th>Meaning unit</th>
<th>Condensed meaning unit</th>
<th>Code</th>
<th>Sub-theme</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>“At these moment there is a lot of resources to follow guidelines, not before long ago, today there is drugs, i.v. fusions, doctors, the doctors there are there.”</td>
<td>Today there are resources to follow given guidelines compared to before</td>
<td>Resources makes it possible to follow given guidelines</td>
<td>Availability of resources</td>
<td>Varied availability to treat malaria infected children</td>
</tr>
<tr>
<td>“Sometimes you may even have to stay for the whole day… you stay for two shift… sometimes three shift to compensate the shortage… so there is a big workload”</td>
<td>Sometimes you have to stay the whole day, and sometimes three shifts to compensate shortage</td>
<td>The nurses have to work overtime because of big workload</td>
<td>Overcrowded and workload</td>
<td>Overcrowded department with positive attitudes</td>
</tr>
<tr>
<td>“She is only thinking of using mosquito nets… that’s all she know(…)So she don’t think she has enough information about how to protect her child from being infected with malaria.”</td>
<td>Not enough information about how to protect the children from being infected with malaria</td>
<td>The relative don’t know how to prevent malaria</td>
<td>Information given about malaria</td>
<td>Lack of knowledge about malaria</td>
</tr>
<tr>
<td>“The attitudes among medical staff here at the ward is good because whatever you are complaining about they make a follow up.”</td>
<td>The staff are following up when you are complaining about something</td>
<td>The staff follow up complaining</td>
<td>Positive environment within the ward</td>
<td>Overcrowded department with positive attitudes</td>
</tr>
</tbody>
</table>
2.6 Ethical consideration

To get permission to conduct the study, the dean of nursing at Kilimanjaro Christian Medical Centre was contacted and gave her approval. The authors had the responsibility to inform all participants in the study about their task in the project and the conditions for their participation. They were informed that participation is voluntary and that they have the right to withdraw their participation at any time. The information to participants shall include all the elements of the present investigation which can reasonably be expected to affect their willingness to participate (Codex, 2009). Both orally and written information were given to the participants before the interview began and a consent was signed from the participants. No identity was disclosed in the study, instead a code number for each participant were used and as soon as transcriptions of the interviews were done the recordings were deleted. This study aimed to determine the experiences that relatives and nurses have regarding treatment of malaria infected children. These questions could have contributed sensitive information about the care. If this would have appeared to be difficult for the participants to deal with they were referred to a contact person for further proceedings.

3. RESULTS

The findings from this study are divided into result from the nurses interviews and results from the relatives interviews. The quotes from the relatives will be presented as a third part since an interpreter was used during the interviews. During the analyzing phase of this interview study there were three main themes identified from the interviews, these were; positive attitudes in an overcrowded ward, varied availability to treat malaria infected children and lack of knowledge about malaria. These three main themes are discussed under sub-themes shown in table 2.
### Tabel 2. The themes and sub-themes identified from the interviews

<table>
<thead>
<tr>
<th>Themes</th>
<th>Sub-themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive attitudes in an overcrowded ward</td>
<td>➢ Overcrowded and workload</td>
</tr>
<tr>
<td></td>
<td>➢ Unable to care for critical ill patients</td>
</tr>
<tr>
<td></td>
<td>➢ Positive environment in the ward</td>
</tr>
<tr>
<td>Varied availability to treat malaria infected children</td>
<td>➢ Accessibility of treatment</td>
</tr>
<tr>
<td></td>
<td>➢ Availability of resources</td>
</tr>
<tr>
<td></td>
<td>➢ Lack of nursing guidelines</td>
</tr>
<tr>
<td>Lack of knowledge about malaria</td>
<td>➢ Information given about malaria</td>
</tr>
<tr>
<td></td>
<td>➢ Relatives adherents</td>
</tr>
<tr>
<td></td>
<td>➢ Relatives lack of knowledge about malaria</td>
</tr>
</tbody>
</table>

### 3.1 Positive attitudes in an overcrowded ward

#### 3.1.1 Overcrowded and workload

All nurses expressed that there was a big shortage of nurses and that the number of patients and nurses were not consistent with each other. The number of patients could sometimes be sixty and at that time three nurses are not enough. One nurse explained that in times like that all they can do is work as a team. Another nurse explained that it was very common that they had to stay more than on shift to compensate shortage.
“Sometimes you may even have to stay for the whole day... you stay for two shift... sometimes three shift to compensate the shortage... so there is a big workload” (Nurse 3)

One nurse mentioned that as long as the number of bed and patients are consistent with each other it is no problem, but when they start to put children in extra beds along the walls and corridors it becomes too crowded to do a good work.

“The environment is good, but sometimes it is concerning about all the patients, but now no, cause sometimes we have 45-60 patients so the rooms must be congested (...) it is difficult (...) The working is tough.. since we don’t have enough nurses” (Nurse 1)

Another nurse stated the problem that they often have to put children with infectious diseases, such as diarrhea, pneumonia together with children with malaria since they do not have enough place to separate them.

The high workload for the staff was also commented by the relatives. One relative mentioned that the shortage of nurses is the main problem and that she feels a responsibility to help them doing their job. One nurse was working for the whole day alone and without break. The nurse asked for help from the relatives so that the job could be done.

“They (the nurses) are doing very well, but for example yesterday they were having only one nurses in the night shift, and the same nurses she stayed the whole day(...) So even sometimes the nurse come and tell her wake me... So it’s like a human resource shortage” (Relative 1)

“There are so few nurses... They are doing their best... She feels sorry for them... She says that she try to help them whenever she can” (Relative 1)
There is no waiting time to get care and treatment at the hospital and the relatives did not experience any problem getting admitted into the ward.

“Once they arrived to the hospital they were admitted the same day... and she says they got taken care of really fast” (Relative 1)

3.1.2 Unable to care for critical ill patients

When a child within the ward requires intensive care they have no option to treat the child within the ward. They can take the child to another room which is closer to the nursing station so that they can have a better control of the patient. One nurse mentioned that critical ill children often are together with many other patients in the same room, and the nurse wished a separate room only for intensive care patients.

“We combined them but if we had another room for intensive care it will be much better. Cause the patients that are most serious does not have a own room and they can get worried and that is not good.” (Nurse 1)

3.1.3 Positive environment in the ward

The environment in the ward was experienced as good from the nurses and did not affect the malaria infected child in a negative way, but they all mentioned that when the ward has its full potential of number of patients it becomes a problem.

The relatives described that the environment within the ward is good. The relatives did not see any factors within the environment that would affect the child in a negative way. Although one relative mentioned that all the windows in the ward are not supplied with mosquito nets. However she did not think it affects the child.

“It’s good... Beds are good and have bed nets(...) It’s clean, they clean here everyday.” (Relative 2)
“Not all the windows have nets... But we have bed nets so it’s okey.” (Relative 1)

The relatives experience good attitudes among the nurses within the ward. The relatives expressed gratefulness for having their children at the hospital and they were not feeling accused or guilty.

“It’s good because whatever you are complaining about they make a follow up... and they don’t accuse you... for not protected your child from having malaria”

(Relative 2)

3.2 Varied availability to treat malaria infected children

3.2.1 Accessibility of treatment

Distance, right treatment and economy were areas of concern for the relatives. The access of malaria treatment for their children and the distance to the hospital varied. One relative thought there was a good accessibility to the treatment and her distance was half hour walk from the hospital. The other two relatives had a longer and more complex way to the nearest hospital where they could get treatment of malaria. They mentioned that there is a pharmacy close to where they live, but they do not do any investigations and may therefore end up with that the child gets the wrong treatment.

“There is only a small pharmacy in his place, there is no hospital. So what happen is once the child gets sick they only buy treatment without going to the hospital. So this may result in that they buy the wrong treatment for the wrong disease.” (Relative 2)

One relative declared that the distance to the hospital and accessibility to the right treatment is the major challenge in the care and treatment of malaria infected children. Another relative said that the financial issue is the major challenge and that it is hard to finance the travels to the hospital.
“The main challenge... is the availability of the health service... it is only a small pharmacy in his place, there is no hospital. So what happen is once the child gets sick they only buy treatment without going to the hospital”

“The main problem is, she saying after some explanation, is financing travels. That’s what faces her... Mmm” (Relative 3)

3.2.2 Availability of resources

When it came to the matter whether or not the nurses believed that there were enough resources within the ward to follow the given guidelines, all of the nurses agreed on that it was not a problem. They all expressed that they had enough medication and that it was never a problem. It was explained by one nurse that the ward uses artemisinin-based combination therapy (ACTs) in the treatment of malaria. One nurse who had been working in the ward for more than thirty years explained that the accessibility of medication has approved over the years and also the number of doctors within the ward, which she states has improved the care of malaria infected children.

“At these moment there is a lot of resources to follow guidelines, not before long ago, today there is drugs, i.v. fusions, doctors, the doctors there are there.”(Nurse 2)

The knowledge the nurses had concerning good hygiene in the care of malaria infected children was that they have to be extra cautious because of the fact that the child might have diarrhea or vomit. They all stated the importance of using gloves and washing their hands. One nurse also mentioned that when they have a very contagious patient they try to have only one nurse with that patient so they can avoid to spread the infection.

“General frontation of malaria must be high cause the patient with malaria might vomit or make diarrhea possible are complications from malaria...so I have to wear gloves, wash the hand and then wear the gloves when I am with the
patient. When I am done I remove the gloves then wash the hands. And you have to change in bed when the patient have vomit or diarrhea.” (Nurse 1)

The availability of resources to provide good hygiene was good. No one of the nurses claimed that there was any shortage off utensils to provide good hygiene. They all said that they had enough gloves, masks and soap. One nurse explained that there are guidelines to ensure good hygiene.

3.2.3 Lack of nursing guidelines

All nurses explained that there were only guidelines for the doctors to use when it comes to drug administration of the malaria infected child. There were no guidelines for the nurses to use in the care of the malaria infected child.

“We have it but most of the doctors have it, but us we have some not.” (Nurse 1)

3.3 Lack of knowledge about malaria

3.3.1 Information given about malaria

When the child is going to be discharged the nurses talk to the relatives about prevention of malaria. The information that is given is about using bed nets, to clean the bushes around the house and to cover the child outside during night. The information that the nurses give to the relatives is mainly about the importance of using bed nets. All the relatives stated that they used treated mosquito bed nets for their children, which they got from the government for free. The infected children had not been given any prophylaxis against malaria. The relatives experience a lack of information about the prevention against malaria because the main focus is on the bed nets and nothing else.

“She is only thinking of using mosquito nets… that’s all she know (...) So she don’t think she has enough information about how to protect her child from being infected with malaria.” (Relative 3)
3.3.2 Relatives adherence to information

The nurses explained that although information about prevention is given to the relatives not everyone follows it. A concern expressed by one nurse was that the relatives did not use the bed nets at the ward during the nights even if they had been told them to use them.

“We tell them to use... bed nets during night. To put socks on the kids when they are playing outside...specially during night time. That will protect them. Ooh... someone are following them, someone don’t.” (Nurse 2)

3.3.3 Relatives lack of knowledge about malaria

The major challenge in the care of malaria infected children experienced by the nurses was the lack of knowledge from the relatives about prevention of malaria. They expressed a lack of knowledge about how the infection is spread among the relatives.

Also the relatives do not think they have enough information about the disease malaria and how the disease appears. One relative thought that malaria is spread by water. One relative expressed that if he would have known the symptoms of malaria his child could have received treatment earlier.

“And she is trying to explain that the child has got malaria from using the water from the river... after finishing school he always goes to the river and plays with his friends... so she is believing that malaria is spread by the water” (Relative 3)

This major lack of knowledge resulted in that the relatives do not follow given information about prevention. It was mentioned by all nurses that the relatives need more knowledge and education about the disease malaria and how to prevent it. One nurse expresses concerns over the fact that many children return to the ward with malaria many times and then claims that the adherents about prevention from the relatives could have prevented it.

“Cause they are giving nets...and then they do not know how to use it. They use
"...it by covering windows instead of covering the beds... so I think they need more education and information. Especially in very infected areas." (Nurse 1)

“(…) of course a big problem is that the mothers and fathers do not know how to protect their child... we tell them how, but they don’t understand” (Nurse 2)

“The major problem is the parents and relatives adherence to the information that we are given them...they don’t follow them (...) I think they just don’t have enough knowledge about the disease malaria (...) sometimes the child returns with malaria again when we have given the information to the relatives the first time” (Nurse 3)

4. DISCUSSION

4.1 Summary of results

Three themes were identified from the interviews with the nurses and the relatives; positive attitudes in an overcrowded ward, varied availability to treat malaria infected children and lack of knowledge about malaria. The environment in the ward is considered good as long as the number patients and number of beds were consistent with each other. The relatives were really appreciating the environment and their experiences of their hospital stay were all good. All the nurses expressed a big issue about the workload within the ward because of the big shortage of nurses. This was something the relatives agreed with, were they also considered the lack of nurses within the ward to be a big issue. The nurses expressed that the ward has enough resources to treat malaria and also to provide good hygiene. There are none existing guidelines for nurses within the care of malaria infected children. The relatives expressed that the availability to receive treatment is good but it depends on the distance to the hospital. When the child is discharged the nurses provide information to the relatives about prevention of malaria. All the nurses agreed that the major challenge in the care of malaria infected children is the lack of knowledge from the relatives about prevention of malaria and the relatives also stated a wish for more knowledge about the disease. This lack of knowledge probably resulted in that the relatives don’t follow given information about prevention.
4.2 Discussion of results

The themes from the nurses and the relatives were consistent with each other and are discussed below.

4.2.1 Positive attitudes in an overcrowded ward

All the interviewed nurses repeatedly expressed a big issue concerning the workload within the ward. There is a shortage of nurses and it became clear to the authors during their study at the ward that sometimes a nurse need to stay several shift in a row. One relative mentioned that one day a nurse was working alone at the ward, and the nurse asked for help by the relative to perform the work. Another concern within the ward is the overcrowding of patients, which makes it difficult for the nurses to accomplish their work. Overcrowding is also an obstacle mentioned by Mwangi et al. (2008) from her study in a pediatric inpatient ward in northern Tanzania. The authors believe that the shortage of nurses and overcrowding within the ward affects the care of the malaria infected children in a negative way. Even though there is a big shortage of nurses, one interviewed nurse whom been at the pediatric ward far more than thirty years implicate a positive change over the years. Compared to many years ago there is today a much greater amount of doctors within the ward. The nurse expresses gratitude since this improvement really benefits her daily work. An improved access to trained health workers is one of the main factors that reduce the prevalence of malaria (Mmbando et al., 2010).

4.2.2 Varied availability to treat malaria infected children

The accessibility for a child who has malaria to get treatment depends on the distance to the hospital. The distance to the hospital can be very long and this affects the fact that the child don’t get treatment soon enough. Two relatives states that the access to a hospital is one of the major challenges in the care and treatment of malaria infected children. This major issue is confirmed by both Maslow and et al. (2009) and Mubyazi et al. (2010). Another problem that could be seen from the interviews with the relatives, was that the absence of a nearby hospital results in no investigation about the disease and therefore often wrong treatment are given. This results in a high risk of developing resistance. If the rapid diagnostic test would be available for those who live in the countryside and a long distance to the hospital the malaria
parasite would be identified and accurate treatment could be given. According to WHO (2010) this would decrease the risk of developing of resistance among the different species of malaria parasites. Apart from the long distance there is a good availability for malaria infected children to receive treatment. This is confirmed by the relatives who states that there is no waiting times, positive attitudes from the medical staff and no problem getting admitted to the ward.

According to World Malaria Report (2010) Tanzania started to adopt given guidelines about prevention and treatment of malaria from World Health Organisation in 2003. However, the guidelines that were used in the pediatric ward were only concerning drug administration and therefore only used by the doctors. The drug to treat malaria that was used at the ward was artemisinin-based combination therapy (ACTs), which is recommended as the primary treatment for malaria by WHO (2010). The nurses were asked how the accessibility of drugs appears to be in the ward and they all stated that there is never a problem and there are always enough medications. A problem that occurs within the ward is when a child becomes critically ill. Critical condition that can occur with a patient who has malaria is severe cerebral malaria, which manifests as encephalitis and may be fatal (Spicer, 2008). The nurses express a great concern regarding the lack of resources within the ward to care for a critical ill patient. There are no other options then to treat the child at the ward, since the hospital does not offer any other alternatives.

4.2.3 Lack of knowledge about malaria

The information that is given by the nurses about prevention are using bed nets, cover the child during evening, clear the surroundings around the house and to use prophylaxis during pregnancy. However, according to the relatives the information that they receive is mainly about bed nets and they express that they want more information about prevention of malaria. Additional important information about prevention according to Koudou and colleagues (2010) is also indoor residual spraying with insecticides, which would be suitable for the relatives to be informed of. It becomes clear that the relatives do not perceive all the information that is given to them. According to the nurses this is because they do not have enough knowledge about the disease malaria. This issue is what all the nurses claim to be the major challenge in the care of malaria infected children. From the interview with the relatives
the lack of knowledge becomes clear when the relatives states that they do not know how the symptoms of malaria appears and that they do not know how the disease is spread. These factors are additional major barriers in the prevention of malaria according to Maslow et al. (2009).

The absence of knowledge among the relatives leads to a lack of adherence to given information about prevention. An example of lack of adherence can be seen at the ward where all the beds are provided with bed nets but according to one nurse not every relative use it during the nights. The authors question whether the relatives use the bed nets at all, if they do not use it at the ward. According to the relatives they are provided with free bed nets from the government of Tanzania. The use of bed nets can according to Bhattarai and colleagues (2007) in combination with free ACT treatment significant reduce the prevalence of malaria among children under the age of five. Children under the age of five are according to WHO (2011) supposed to be provided with prophylaxis during the season when the prevalence of the mosquito is at the highest level. No one of the children who were admitted at the ward had been given any prophylaxis. The authors believe that the reason for this could be the location of the study. The city was located at high ground and the humidity level was low, which according to Rombo (2011) is not a suitable condition for the malaria parasites and therefore a less need for prophylaxis treatment.

4.3 Discussion of method

4.3.1 Credibility

To establish credibility all the nurses and the relatives were asked the same questions and therefore they were able to express their own views and experiences. The authors were given intimate knowledge from the informants by using qualitative interviews as data collection method. To capture the informants own experiences semi-structured open ended questions were used (Polit & Beck, 2008). Since the authors are not professional interviewers the validity of the communication can be discussed. Improvement could have been made if the authors were more skilled as interviewers. The interview questions were not tested in
advanced because of the lack of participants. If this had been done the credibility of the study would have increased.

The fact that the authors did not have any preconceived ideas about how pediatric malaria treatment is conducted in Tanzania, this result in greater transparency in the interpretation of the results of the study. All the participants in the study were selected from the same pediatric ward at Kilimanjaro Christian Medical Centre in Moshi, Tanzania. All the children infected with malaria were admitted into the same pediatric ward, which were suitable for the authors in their selection of participants. The sample group of nurses and relatives were wished to be larger to provide a greater credibility. However, the variation of the sample group increased the credibility. The nurses working experiences showed a large variation, which provides wide-ranging views and experiences. The relatives had all different relationships to the children and they represented both city and rural areas of the country. The authors believe that this provide a greater variation of the result in the study. The interviews took place in the ward during the nurses working hours. This may have been stressful for the nurses because of the workload and therefor effect their answers. A secluded room were used to ensure confidentiality. However, the interviews were interrupted several times by medical staff. Because of the children’s condition the relatives interviews were situated within the ward. This might have influenced their answers since they were not able to feel completely anonymous. The fact that the interpreter who was used in the relatives interviews was a medical student might also have an impact on their answers. The authors wished for an impartial interpreter, but because of lack of time and other contacts, this was the only option. By using an interpreter there is always a risk of misunderstanding between the three involved parts. At the same time the use of an interpreter was needed to conduct the interviews with the relatives.

Language difficulties are something that needs to be considered in the interviews. The informants were often unsure of how to answer the questions. Sometimes the questions were also misunderstood. For example the relatives did not understand what the authors meant with the question about environment. Since they thought it was about attitudes and relation between the staff, even though the authors tried to explain the meaning of environment. This was also a problem that occurred with the nurses interviews where a question often needed to be clarified.
4.3.2 Dependability

By showing a clear line throughout the text to the resulting themes the study reached dependability. To manifest the informants opinions and clarify their similarities and differences a content analysis were chosen by the authors (Graneheim & Lundman, 2004). Throughout the analysing process the authors constantly reflected upon the levels of abstraction and possible interpretation. The result from the analysing process is strengthen by using codes and themes. A great precaution was taken by the authors during the analysing process to ensure that the codes, sub-themes and themes corresponded to the transcribed material from the interviews.

4.3.3 Transferability

This is a qualitative study and can therefore not be generalized to all pediatric wards caring for malaria infected children in Tanzania. However, this study illuminates experiences among nurses and relatives concerning the care of malaria infected children at Kilimanjaro Christian Medical Centre in Moshi and enlighten the current obstacles and challenges they are facing. The authors believe that this study can have a clinical relevance since the result of the study determines the major lack of information and knowledge among relatives about malaria. These findings show the importance of giving information to relatives to increase their knowledge and to ensure that the relatives understand the given information. This is something that the nurses can use in their way of improving the pediatric malaria care. The authors find it to be of interest to extend the study to other areas of Tanzania to investigate the differences between hospitals. The care of malaria infected children may appear different in rural areas where the hospitals are not as developed as Kilimanjaro Christian Medical Centre. In rural areas in Tanzania, cultural differences could also have a great impact on relatives opinions concerning malaria care (Maslow et al., 2009). Since the study took place in a low-exposed area it would be interesting to investigate the malaria care in very high exposed areas.
4.4 Conclusion

A good environment, positive attitudes among medical staff and an availability of resources are positive elements that could be seen within the ward in the care of malaria infected children. Even though there has been a progress in the care of malaria infected children, this study determines that there are still many challenges left to deal with. To continue the fight against malaria among children it is of great importance to focus on the relatives lack of knowledge about malaria, the workload issue and the long distance to hospital.

4.4.1 Nursing implications

It is essential to state that our obligation as nurses is not only to treat sickness but also to prevent it. To prevent illness it is of great importance that information is given to those in need. One important role as a nurse is to provide education about the disease malaria to the relatives, in order to protect their child. These findings provide a good reason to establish guidelines regarding prevention of malaria for the nurses to use when they inform the relatives.

REFERENCES


APPENDIX 1

Department of Public Health and Caring Sciences
Section of Caring Sciences

Participant information and consent form to nurses

Study regarding experiences in the care of malaria infected children.
We are two nursing students at Uppsala University in Sweden and our names are Tove Nyberg and Madeleine Nilsson. We are going to perform a minor investigation in Tanzania in order to write our final thesis.

The study *Experiences in the care of malaria infected children in a pediatric inpatient ward in Tanzania* aims to investigate the experiences that nurses and relatives to malaria infected children have regarding the pediatric inpatient care at Kilimanjaro Christian Medical College, Tanzania.

Participants
The participants of this study will consist of nurses and relatives to malaria infected children from a paediatric inpatient ward at Kilimanjaro Christian Medical College, Tanzania. We wish the nurses to be registered and English speaking and been working at the pediatric ward for at least one year. Participation in the study will be completely voluntary.

What Participation Involves
An individual interview will be performed. The questions will deal with topics such as compliance to guidelines, healthcare environment, hygiene, prevention, workload and drug administration regarding malaria. The interview will take approximately 20-30 minutes. The interview will be recorded with a tape recorder.
Participants full rights
All the interviews will be anonymous and participation will be completely voluntary. The participants will be free to decline to answer any question without giving a reason.

Confidentiality
Confidentiality will be assured in the study and there will be no names revealed. The interviews will take place in privacy and will ensure confidentiality.

Benefits
There will be no economic benefit to the participants. However it is important to illustrate nurses experiences in the care of malaria. Hopefully this will lead to improvements in current nursing care in malaria infected children and highlight the importance of continued fight against malaria in developing countries. A copy of the completed thesis will be sent by e-mail to the participants if they wish.

Who to Contact
Any questions or concerning can be sent via e-mail to
Tove Nyberg: tove_nyberg@hotmail.com
Madeleine Nilsson: madelejne_n@hotmail.com

Supervisor at Kilimanjaro Christian Medical College:
Supervisor in Sweden: Dr. Clara Aarts: clara.aarts@pubcare.uu.se

Consent to participate in the field study:

I, _________________________________have read the contents in this form. My questions have been answered. I agree to participate in this study.

Signature of participant________________________________________________________
Signature of researchers_____________________________And__________________________________
Date of signed consent____________________
Department of Public Health and Caring Sciences
Section of Caring Sciences

Participant information and consent form

Study regarding experiences in the care of malaria infected children.
We are two nursing students at Uppsala University in Sweden and our names are Tove Nyberg and Madeleine Nilsson. We are going to perform a minor investigation in Tanzania in due to write our final thesis.

The study *Experiences in the care of malaria infected children in a pediatric inpatient ward in Tanzania* aims to investigate the experiences that nurses and relatives to malaria infected children have regarding the pediatric inpatient care at Kilimanjaro Christian Medical College, Tanzania.

Participants
The participants of this study will consist of nurses and relatives to malaria infected children from a pediatric inpatient ward at Kilimanjaro Christian Medical College, Tanzania. The relatives included in this study must have children between the age of six months and five years old and are hospitalized in a pediatric ward due to malaria. If the relatives do not speak English, an interpreter will be connected.

What Participation Involves
An individual interview will be performed. The questions will deal with topics such as experienced attitudes among health workers in the ward, opinions regarding the treatment that the child receives, prevention against malaria, how available the health care is, care
environment and if this effects the care of their children. The interview will take approximately 20-30 minutes. The interview will be recorded with a tape recorder.

**Participants full rights**

All the interviews will be anonymous and participation will be completely voluntary. The participants will be free to decline to answer any question without giving a reason.

**Confidentiality**

Confidentiality will be assured in the study and there will be no names revealed. The interviews will take place in privacy and will ensure confidentiality.

**Benefits**

There will be no economic benefit to the participants but it is important to illustrate relatives experiences in the care of malaria infected children. Hopefully this will lead to improvements in current nursing care in malaria infected children and highlight the importance of continued fight against malaria in developing countries. A copy of the completed thesis will be sent by e-mail to the participants if they wish.

**Who to Contact**

Any questions or concerning can be sent via e-mail to

Tove Nyberg: tove_nyberg@hotmail.com

Madeleine Nilsson: madelejne_n@hotmail.com

**Supervisor at Kilimanjaro Christian Medical College:**

**Supervisor in Sweden:** Dr. Clara Aarts: clara.aarts@pubcare.uu.se

**Consent to participate in the field study:**

I, __________________________have read the contents in this form. My questions have been answered. I agree to participate in this study.

Signature of participant________________________________________________________

Signature of researchers________________________________________________________

Date of signed consent____________________
APPENDIX 3

Interview guide to the nurses

Background data

1. How long have you been working as a nurse?
2. For how long have you been working in this pediatric ward?
3. In what year are you born?

Topics and questions related to the aim

Guidelines

- Are there any guidelines for malaria treatment in the ward that you follow?
  - Which are these guidelines?
- How do you think it is possible to follow these guidelines?
- How is the availability of resources in the ward for following these guidelines?

Environment

- How do you experience the health care environment to be within the ward?
- Are there resources in the ward if a child would be acutely ill?
  - What do you do if a child requires intensive care?

Hygiene

- What is good hygiene within close contact to patients with malaria according to you?
- Do you think it is possible to achieve good hygiene in this ward?

Workload

- How does the workload appear to you within the ward?
- How does this workload affect the care of the malaria infected children?
- How many children come to the ward every week due to malaria?

Drug administration

- How do you experience the drug administration of malaria within the ward?
Prevention

- Do you talk to the relatives about prevention against malaria?
  - What information do you give to relatives about malaria and its prevention?

Other

- What do you think is the major challenges in the care and treatment of malaria infected children within this ward?
- Would you like to add something?
APPENDIX 4

Interview guide to the relatives

Background data
1. In what year is your child born?
2. How long has your child been infected with malaria?
3. Has your child been infected with malaria in the past?
4. How long has your child been treated in this pediatric ward?
5. Do you live in the countryside or in the city? How far from the hospital? How can you come to the hospital? Walk, buss?

Topics and questions related to the aim

Treatment
- How accessible would you consider it is for your child to get treatment and cure against malaria?
- What kind of problems do you experience regarding the treatment of malaria? (e.g. financing)

Environment
- How do you experience the healthcare environment within the ward?
- In what way do you think the healthcare environment affects the care of your child?

Attitudes
- How do you and your child experience the attitudes among medical staff at the ward?

Prevention
- In what way do you protect your child from being infected with malaria?
- Do you think you have enough information about the disease malaria and how to protect your children from getting infected with malaria?
- Do you receive any valuable information about preventing malaria from medical staff at the ward?
Other

- What do you think is the major challenges in the care and treatment of your malaria infected child?
- Would you like to add something?