“Nothing can be changed if the people don’t change”

Costa Rican registered nurses’ views and experiences of caring for patients with dengue fever

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Abstract

Dengue fever has increased to the point where it has become a major international public health and economical problem, mainly in urban and semi-urban areas in tropical and subtropical regions. Worldwide 2.5 billion people live in regions where dengue can be transmitted and approximately 100 million people get infected yearly. In 2002 there was a great outbreak in Latin America, and Costa Rica was in the top three regarding reported cases. At the time of writing, reports show that cases of dengue are currently low in Costa Rica. Although the figures vary, dengue remains a public health problem. This study aimed to describe Costa Rican registered nurses’ views and experiences of caring for patients with dengue fever. Data were collected with semi-structured interviews and conducted with eight registered nurses from Costa Rica, and analysed with qualitative content analysis method with search for similarities and differences which later were categorized. The result was divided into five categories; the conception about dengue fever, caring, patient education, prevention and the future. The result showed a similar perception of the disease and was described as terrible, causing a lot of suffering for the patient, as well as a burden on the health care, that requires large financial resources. To control dengue and suppress the proliferation it is important to have different preventive means and to educate people to achieve a change of the mindset.

Key words: dengue fever, Costa Rica, nursing, experience, view, prevention, education
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INTRODUCTION

Dengue fever is the most increasing vector-borne disease, and has become thirty times more common in the last fifty years (Folkhälsomyndigheten 2014b). Today 40 %, as many as 2.5 billion, of the world’s population live in one of the 100 endemic countries where dengue can be transmitted (CDC 2014b). Every year approximately 100 million people get infected by the virus globally (Hagberg 2015). The dengue infection is usually asymptomatic, but when symptomatic it can develop into mild dengue fever or any of the more severe types; Dengue Hemorrhagic Fever (DHF) or Dengue Shock Syndrome (DSS) (Brathwaite Dick, San Martín, Montoya, del Diego, Zambrano & Dayan 2012). Yearly dengue fever causes 22 000 deaths, mostly among children, and 500 000 cases of DHF is reported, according to The World Health Organization (WHO) (CDC 2014b). The symptoms can vary but initially high fever, abdominal pain and muscle-joint pain can occur. Later it can develop into a more severe phase which can affect the liver, cause hemorrhages of the skin and mucous membranes and also generate shock. Serious illness is assumed to be caused by repeated infections by different virus types. It is more likely that children aged three to six years get life-threatening dengue fever (Norrby & Hagberg 2015). As stated by the Centers for Disease Control and Prevention (CDC) early recognition and treatment is important to lower the risk for complications and death (CDC 2015). Complications include encephalitis and prolonged fatigue (Hagberg 2015). In the recent decades the transmission has increased to the point where it has become a major international public health problem, mainly in urban and semi-urban areas, in tropical and subtropical regions (WHO 2015). We would like to develop a wider knowledge about dengue fever by studying Costa Rican Registered Nurses’ views and experiences about this global health problem.

BACKGROUND

Costa Rica

Costa Rica is situated in Central America, which connects North America with South America. The country has dual coastlines, with the Pacific Ocean to the west and the Caribbean Sea to the east. Costa Rica has two seasons, a rainy period during May to November, and a dry period from December to April.

The republic of Costa Rica is usually called Latin America's oldest democracy, it has two short exceptions but apart from this it has been stable since 1889. The country is one of the region's most stable countries with a relative prosperity, this despite violent upheaval in neighboring countries. The foundations of the welfare state were laid in the 1940s, when a social security system was introduced. Nowadays all wage earners and their families are covered by the well-developed welfare system that includes health care, accident insurance and pension (Utrikespolitiska institutet 2014b). Costa Rica has the best social welfare system, and the best living conditions, in Central America. Despite the country's prosperity, there are large gaps between rich and poor. Another social problem is the organized crime and drug trafficking that goes through Costa Rica.
from South America (FN-sambandet 2014). The most important factors of the economy is export of electronics, tourism and agriculture (Utrikespolitiska institutet 2014a).

The Costa Rican health care system

The Costa Rican health care system was established in the 1940’s and started as a social security for workers within the public sector, but eventually developed to become one of the most effective health care systems in Latin America. Nowadays the indicators for infant mortality and life expectancy are comparable to European high income countries. The health care system is structured in the establishment of the Caja Costarricense de Seguro Social or CCSS (Costa Rican Social Security Administration). The prevention, recovery and rehabilitation of health is delegated the CCSS from The Costa Rican Ministry of Health. The planning, promotion and coordination of all public and private activities within health care, and governing functions as defining the national policy of health care, lies within the responsibilities of the Ministry of Health (WHO 2010). All citizens in Costa Rica has access to the public health care system, that currently is financed by around a 9 % employee income tax that all workers are obliged to pay (CCSS 2015).

Dengue fever

History

The dengue viruses originated from monkeys and spread to humans between 100 to 800 years ago, in Africa or Southeast Asia (CDC 2014b). The first description of dengue fever was made in the late 18th century (Hagberg 2015). Dengue remained relatively small and kept to a restricted geographic area until the middle of the 20th century. Then, during the World War II, the mosquitoes are believed to have been transported in cargo and spread globally. DHF was first documented in the 1950’s, through epidemics in Thailand and the Philippines. A larger number of DHF cases appeared in Latin America and the Caribbean in the beginning of the 1980’s (CDC 2014b).

Epidemiology

Dengue fever often appears in large outbreaks, in cyclical variations globally. Some years with high epidemics and other years with non-epidemics (WHO 2009). Since dengue fever occurs yearly in many parts of the tropic and sub tropic areas it is referred to as an endemic disease. These areas are also at high risk for epidemic dengue fever, because of the large number of infections in a short amount of time. Rainfall is optimized for the Aedes mosquitoes breeding, which increases the populations during the rainy seasons (CDC 2014b). In recent years, many countries have described a continued increase in cases of dengue fever. The reasons behind this are not clear, but the following factors may be relevant: increased prevalence of mosquitoes as a result of climate change, failed control measures, demographic changes associated with urbanization and in some cases weakened public health programs (Folkhälsomyndigheten 2014a).
In 2002 there was a great outbreak in Latin America and Costa Rica was in the top three regarding reported cases. Later, in 2005, a dengue epidemic occurred in Costa Rica which led to three times more confirmed cases than the previous year. Almost 38,000 cases were confirmed, 45 of them were DHF (Brathwaite Dick et al. 2012). The number of reported cases of dengue fever in Costa Rica had increased from 22,243 in 2012 to 49,868 in 2013 (PAHO & WHO 2013; PAHO & WHO 2014a). At the time of writing, reports show that cases of dengue are currently low in Costa Rica (PAHO & WHO 2015). Although the figures vary, and despite the efforts that have been made to stop dengue, it remains a public health problem in the Americas (PAHO & WHO 2014b).

Pathophysiology

The dengue viruses belong to the flavivirus group, and is a vector-borne zoonosis, transmitted to humans by the Aedes mosquitoes. The viruses cannot be transmitted between humans, but humans and probably some species of monkeys can act as reservoirs (Folkhälsoomyndigheten 2014a). The transmission of the disease is caused by two types of mosquitoes, Aedes aegypti and Aedes albopictus, which exist around the world (CDC 2014b). A person can contract the virus from the bite of an infected Aedes mosquito. When a mosquito bites an infected human, they themselves become infected and can later transmit the viruses to other people (NIH 2010b).

There are four types of dengue viruses and dengue fever can be caused by any of the four similar viruses, categorized as dengue 1-4 (DENV 1, DENV 2, DENV 3, DENV 4). It is possible to get infected several times, because one type of the virus does not protect from another (CDC 2014b). However it is only possible to get infected once by the same serotype (NIH 2010a). Re-infection with dengue fever has been proposed as a risk factor for suffering from severe illness, but the correlation is not entirely clear. There are probably factors of the individual which has an impact on the risk for complications. The incubation period is usually five to ten days (Folkhälsoomyndigheten 2014a).

The infection can vary from an asymptomatic to a serious state. After incubation, the disease abruptly enters three phases: the febrile, critical and recovery stage. Dengue should be seen as a single disease, but with altered conditions, that varies from benign to severe states that could lead to death (PAHO & WHO 2014b). The disease is usually benign and sometimes people only get transient fever for a few days (Folkhälsoomyndigheten 2014a). As previously stated, a less common, but more serious medical conditions, is DHF. While infected with DHF the fever remains for two to seven days with additional symptoms of nausea, vomiting, abdominal pain, joint- and muscle-pain and headache. The disease then enters into a hemorrhagic fever that is characterized by bleeding in mucous membranes, such as the gastrointestinal tract, the oral mucosa and the skin, this condition can be mortal. The capillaries become extremely penetrable while having a hemorrhagic dengue fever, which causes fluid outflow from the blood vessels. This can develop into hypovolemia and a circulatory shock called Dengue Shock Syndrome (DSS). The mortality rate is high unless adequate fluid therapy is given (Hagberg 2015).
The Aedes aegypti mosquitoes

The characteristic of the Aedes aegypti mosquito is its small, dark body with white lyre shaped markings and banded legs. The mosquitoes prefer to bite indoors during daytime and is most active around two hours after sunrise and several hours before sunset, but can also bite at night. The male and female mosquitoes feed on plant nectar, however the females needs blood to produce eggs and therefore also, feed from blood of humans. The mosquitoes usually live in areas where it is a lack of piped water systems and lay their eggs during daytime, in containers with water which can be either natural locations such as cavities in trees but also artificial containers. Artificial containers can be either water storage containers, flower pots, tires, plates under potted plants, flower pots, buckets, cans, clogged rain gutters, water bowls for pets, coconut husks, birdbaths, etc. Approximately three days after the female have fed on blood she lay her eggs in a water filled container. The eggs can survive for a long period of time because they are resistant to desiccation and while rain starts to fall, the larvae hatch. The larvae feed on small aquatic organisms, algae and particles of plant as well as animal material in the water filled containers. It takes seven to eight days for the egg to become an adult mosquito and their life cycle last for about three weeks (CDC 2014a). In Spanish there is a word for these natural and artificial water containers that the mosquitoes use to breed in, and the word is criaderos. In this study we will use the word criaderos when describing breeding sites, since there is no good translated word in English.

Preventive actions on dengue fever in Costa Rica

In 2014 The Costa Rican Ministry of Health listed actions to be taken against dengue fever, by developing a national strategy called “My community without dengue”, and in addition, implemented a strategy to eliminate all the criaderos. Each district in the country has a responsibility to disseminate information regarding dengue fever which is closely monitored by the government each week to ensure that the work is done. Logistic support has been given to the areas where the largest numbers of transmitting persons appears. They have strengthened the bi-national work with Panama, at the border cross, to be able to control the disease. National agreements have been developed for interventions in the affected communities, and there has a been strategic alliances between the health department and other institutions and organizations. Also a project has started to form a law on the prevention and the control of dengue (Ministerio de Salud 2014).

The foundation of caring sciences

Caring science is characterized by having a patient-perspective, which is the foundation of the care and can be used as a tool to reach the purpose of caring. When caring with a patient-perspective, the patient is the center of the care and both the patient and the caregiver are seen as experts. They possess different but equally important knowledge; the patient has knowledge about him- or herself and the caregiver through their professional expertise. The patient’s experience of feeling involved is important for the experience of health. If the patient does not get involved in the care, but instead adopts a passive role, it may lead to suffering caused by the health care, and the patient may experience powerlessness and vulnerability. The patient-perspective should also be seen through an ethical perspective, which places demands on the caregiver, towards the
patient (Dahlberg & Segesten 2010, pp. 105-111). To provide optimal care, based on
caring science, the care should be focused on each individual’s life-world. In the life-
world perspective, the patient’s daily life is important, and is used to gain a greater
understanding of how situations can be experienced. The life-world perspective states
that every person should be seen as unique, and that every situation can be perceived in
different ways by each individual. This requires the caregivers to be interested and
willing to understand how health, disease, suffering and caring is experienced by the
patient and how it affects them, in order to support their health process (Dahlberg &
Segesten 2010, pp. 126-128). A care with a life-world perspective requires that the
caregiver adapts an openness and responsiveness. The caregivers need to be open when
meeting patients, and have cognizance and a reflecting view on their own life-world and
preconceptions to override their own understanding (Dahlberg & Segesten, 2010, pp.
155-156).

The registered nurses as an educator
The four fundamental responsibilities for the registered nurse is to promote health,
prevent disease, restore health and alleviate suffering. The need for nursing is universal.
The registered nurse should demonstrate professional values such as respect, sensitivity,
compassion, credibility and integrity (SSSF 2014). Dahlberg and Segesten (2010, pp. 240-
245) believe that to encourage learning might be the most important task for the registered nurse. Teaching is included in the work of a
registered nurse and is essential to create good care. Caring includes that the registered
nurses sometimes act as teachers to their patients, in order to provide their professional
knowledge about the health processes and to strive for involvement. Meanwhile, the
patients and their close ones have their own distinct knowledge gained through their
life-world. Every individual's learning begins in their life-world and it is in and through
the life-world that each individual learns about themselves and their environment. The
lived body has a central function in the life-world and is therefore central to learning. To
strive for learning and understanding is essential to health and survival. When the
caregiver focuses their actions on teaching their patients, it is called patient education.
Patient education may focus on health, illness, knowledge that may facilitate the
patients situation, and also factual information and instructions.

A big part of the preventive work is regarding education. Registered nurses play an
important role when it comes to working preventively. Tither (2014) describes how the
registered nurse has a key-role in providing the patients with relevant information in
order to prevent for example dengue fever. A message map is proposed to be used as a
communication tool to educate patients before traveling to countries where they might
be at risk to get infected by dengue or chikungunya fever. Although the focus of the
article is about pre-travel health consultation, the importance lies within the role of
information. In order to prevent, the registered nurse enable the patients to get informed
and more involved in their choices and precautions.
PROBLEM
Since 2.5 billion people worldwide are at risk of getting infected with dengue fever, it is a global concern, mainly regarding health and economical aspects, and therefore very important to illustrate. There is a great amount of medical research regarding dengue fever including DHF, but an obvious lack of caring science on the subject. As residents in Sweden we have limited experience of dengue fever, since it is a tropical disease. Therefore we would like to gain knowledge of what it is like to be a nurse in a different part of the world and to treat and care for patients with, to us, completely foreign health problems. We hope this study can lead to gained understanding on how caring for patients with dengue fever can be experienced by registered nurses in Costa Rica. Hopefully nurses’ perspectives on dengue fever can contribute to a broader view of the disease, in order to improve the health care.

AIM
The aim of this study was to describe Costa Rican registered nurses’ views and experiences of caring for patients with dengue fever.

METHOD
Study design - qualitative methodology
The design of this study is a qualitative methodology, inspired by the phenomenological approach since its focus lies within the life-world perspective, which was central throughout the interviews. A phenomenological approach is preferable since the focus is on human consciousness, and lived experience (SBU 2014). The central part of phenomenology is to describe a phenomenon as it is understood, perceived or experienced by a subject. The fundamental aspects of this method is to understand and conceptually determine reality as it appears to us, and is perceived by people, as subjects (Dahlberg 1997, pp. 56-57).

Selection of the participants
The director of the nursing department at each hospital, who helped us to find participants that fitted in the criteria, mainly chose the selection of the participants for this study. The inclusion criteria from the start was that the participants had to be registered nurses, have experiences of caring for patients with dengue fever and speak English. However, unknowingly to us, there were difficulties in finding participants who spoke English fluently. Therefore we adjusted our criteria to also include nurses who spoke Spanish, since this is the official language in Costa Rica. A total of nine registered nurses were selected to participate in the interviews, however one of the interviews was deselected due to poor quality of the recording and difficulties to hear what was said. The selection process was not affected by the participant’s age, gender, sexual preference or religious beliefs. The respondents are referred to as "the participants" and "the registered nurses" throughout the study.
A total of nine interviews were conducted, of which one was excluded due to poor recording quality resulting in one fall out. The interviews are numbered from one to nine, and each participant is referred to as that specific number. Since interview number six was deselected, it resulted in eight completed interviews. Therefore one participant will still be referred to as number nine. The participants consisted of three female and five male in the ages 37 to 56, with working experience between 11 to 26 years. The characteristics of the participants are shown in Appendix 1.

Data collection

Data was collected through individual, semi-structured interviews with eight registered nurses in Costa Rica. Semi-structured interviews are based on the assumption that it is not possible to initially know what issues will be important and significant. The qualitative interview requires that the interviewer develops, adopts and follows up on what may be appropriate for the situation and for the central purpose of the survey (Starrin & Renck 1996, p. 56). We recorded the interviews and afterwards discussed them, in order to make improvements of our interview techniques. The interviews lasted between 10 to 25 minutes. After all interviews were conducted they were transcribed verbatim and printed in order to ease the analysis process. The interviews were conducted in three different, public hospitals in Liberia, Nicoya and Puntarenas in Costa Rica. The interview-guide is attached in Appendix 2.

The setting of the interviews was in the hospital, as this seemed to be the natural place. The main interviewer, a co-interviewer, the participant and occasionally an assisting interpreter partook in the interviews. The main interviewer and the co-interviewer took turns on being the head leader, to be responsible for the questions as the co-interviewer adjusted appropriate follow-up questions.

Ethical considerations

According to SFS (2003:460, 2 §) research at bachelor level does not need permission from the regional committee of ethics. Even though permission is not required, we followed the rules regarding information and consent. To be able to conduct the interviews at each hospital, the hospital director was informed of the study, and gave approval. Before each interview was to be conducted, the participant was provided both written and verbal information about the purpose of the study, as well as given the interview guide to be read trough, if desired. Attached to the written information was a consent form, which was to be signed by the participant before conducting the interview. Information was also given that all collected data was to be handled confidentially throughout the whole process and that participation was voluntary and that the participants could withdraw their participation at any moment, without explanation. A copy of the completed study will be sent to the participants upon request. When the study is completed all the collected data will be destroyed after its purpose being fulfilled.
Pre-understanding
Since dengue fever is transmitted in tropical countries we had a very limited pre-understanding about the disease in general, neither did we have knowledge of how the health care system is organized in Costa Rica. Since both of us have visited the country before, we had former experiences of the country and its cultural concepts.

Data analysis
The study was analysed with a qualitative content analysis method, using an inductive approach. Qualitative content analysis method is used to examine and interpret texts, such as transcribed interviews. An inductive approach gives an opportunity of an unbiased analysis of the texts, which can be based on people's stories about their experiences (Lundman & Häggren Graneheim 2008, pp. 159-160). This method was suitable since our aim was to describe the registered nurses view and experiences. The focus of the qualitative content analysis is to describe variations by identifying similarities and differences that later are expressed in categories. When creating the categories the context is of great importance. One aspect is that interpretation of texts requires knowledge about the context that the study was conducted in. Further, the text must be seen as a cohesive unit, and no parts from the text can be taken out from its relation (Lundman & Häggren Graneheim 2008, p. 162).

The analysis process
One of the interviews was conducted in English, five were performed in a combination of English and Spanish and two solely in Spanish. All of these interviews were translated from Spanish into English, both with help from an interpreter and with our own knowledge in Spanish.

After translation the interviews were transcribed verbatim and printed to facilitate the continuous process. The material from the interviews was used as an analysis unit, which was of a manageable size. Two domains were identified; views and experiences. Subsequently, the meaningful units were picked out, which could either be words, sentences or paragraphs of texts associated by their content and context. Later the meaningful units where condensed and abstracted, and provided with codes. Condensed refers to the text to be more compressed and manageable, to abstract the text involves lifting the contents to a higher logical level. The codes works as titles or labels of meaningful units (Lundman & Häggren Graneheim 2008, pp. 162-164). The analysis process continued with categorization, the codes with similar contents were divided into subcategories and categories. The categories covered all data, no data corresponding to the purpose was excluded due to a lack of an appropriate category. Neither could the data could fall between two categories or be sorted in more than one. An example of the analysis process is shown in Table 2. In the beginning of the analysis process five categories and eight subcategories were presented, which later was converted into five categories and thirteen subcategories (Table 3).
Table 2. An example of a content analysis process

<table>
<thead>
<tr>
<th>Meaningful unit</th>
<th>Condensed meaningful unit</th>
<th>Code</th>
<th>Sub category</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>That is a problem for the country because the people don’t prevents for this….</td>
<td>Problem for the country because the people don’t prevents. The prevention here is zero.</td>
<td>People don’t prevent</td>
<td>Difficulties within prevention</td>
<td>Prevention</td>
</tr>
<tr>
<td>on one side it is good, but on the other side, the people don’t prevent. The</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>prevention here is zero…. The awareness that I have to prevent is zero (9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>You need to have a lot, lot of vision/attention, because patients with dengue</td>
<td>Constant observation because complications can appear at any moment.</td>
<td>Constant attention for complications</td>
<td>Nurses responsibilities</td>
<td>Caring</td>
</tr>
<tr>
<td>can get complications at any moment… You need to watch what complications the</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>patient might get….. With constant observation (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(explain about fluids in the body) and when I explain I use a bottle as an</td>
<td>Use a bottle as an example to explain what happens in the body</td>
<td>Use simple means to explain</td>
<td>Individual education</td>
<td>Patient education</td>
</tr>
<tr>
<td>example, which is something that people recognize (7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**RESULT**

The analysis process resulted in the categories: the conception about dengue fever, caring, patient education, prevention and the future followed by thirteen subcategories (Table 3). The registered nurses’ views of the disease were very similar. They described the disease as a big problem, which caused a lot of symptoms and suffering for the patient, as well as being a burden for the community and the health care. A communal
opinion expressed the disease being caused by people's lack of care, awareness and knowledge and that this needed to be changed in order to improve the existing situation. This was seen as a consistent red thread throughout the whole thesis.

Table 3. Categories and sub categories

<table>
<thead>
<tr>
<th>CATEGORIES</th>
<th>SUB CATEGORIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The conception about dengue fever</td>
<td>Unpredictable disease</td>
</tr>
<tr>
<td></td>
<td>Dengue - the terrible disease</td>
</tr>
<tr>
<td></td>
<td>People's ignorance</td>
</tr>
<tr>
<td>Caring</td>
<td>The health care system</td>
</tr>
<tr>
<td></td>
<td>Nurses responsibilities</td>
</tr>
<tr>
<td></td>
<td>Complexity of the caring</td>
</tr>
<tr>
<td>Patient education</td>
<td>Community education</td>
</tr>
<tr>
<td></td>
<td>Individual education</td>
</tr>
<tr>
<td></td>
<td>Self-care at home</td>
</tr>
<tr>
<td>Prevention</td>
<td>How to work preventive</td>
</tr>
<tr>
<td></td>
<td>Difficulties within prevention</td>
</tr>
<tr>
<td>The future</td>
<td>Difficulties and opportunities</td>
</tr>
<tr>
<td></td>
<td>What needs to be changed</td>
</tr>
</tbody>
</table>

The conception about dengue fever

This category covers the registered nurses’ views and conceptions of the disease. Topics were brought up, such as the irregularity in numbers of patients, the nurses’ own personal experience of the disease and people's lack of knowledge and understanding. The main focus concerning the conceptions were problems with people's attitude and knowledge. This category is divided into three subcategories.

Unpredictable disease

One problem that was highlighted was the irregularity of number of patients. When an outbreak starts it can create a huge patient group in a short amount of time. This leads to an increased burden on the hospital and its resources. For example one registered nurse explained that during an outbreak, the hospital where she worked had 550 patients in need of controlling their level of platelets each day. This created a chaos in the hospital's laboratory. The disease was described to appear in cyclical variations with severity and number of cases pending from one year to another. As one of the registered nurses described it;

“.....but it’s unpredictable. We have years where there is no cases....And other years when it is thousands... it’s terrible.” (Participant 9).

One of the participants had a theory about why the outbreaks of dengue fever differs in periods of time and severity. Her opinion was that when a community is affected by the dengue fever outbreaks, people get frightened and start to care. They then perform all
the necessary measures in their homes, like taking care of all the garbage, clean all concerned areas and eliminate all possible criaderos. When the number of cases decrease people will eventually stop to care, and that is when an outbreak can appear again.

“I think that when there is dengue the population get frightened, and care about everything, garbage, all is good, all the things is good. And then it comes back after 2-3 years again.” (Participant 8).

The mutual view was that the disease was currently under control and that the number of cases were maintained.

Dengue - the terrible disease

Three of the registered nurses had personal experiences of the disease, since they themselves had been infected with the dengue virus. They all expressed their experience of being a patient of dengue with words as horrific, terrible and a tragedy. One of the registered nurses described her personal experience as;

“I was patient for dengue….it was Horrific.” (Participant 2).

The picture of the severity of the disease varied from being mortal, severely acute to not being mortal at all.

“The sickness is very ugly. I had it. It's very dangerous, you can die from it.” (Participant 2).

“It’s a disease that produces a lot of symptoms. That is a damaging condition in general for the patient. But it’s not mortal....”(Participant 9).

One of the registered nurses who had a lot of experiences of caring for patients with dengue fever expressed that he as a nurse had a different point of view than the public. He explained that while working with the disease he has seen a lot, including patients in severely critical states. The registered nurse discussed the big patient group, stating that the people do not see that and therefore do not understand the severity of the disease;

“The people don’t see, maybe. They know some things. But I have seen, uuuuhf, a lot of things in patients with dengue. Dengue, dengue, dengue... oouf. A lot of things..... “ (Participant 7).

People’s ignorance

The major problem with the disease, and the main focus during the interviews, concerned people’s absence of awareness and responsibility, as well as the ignorant attitude and the flaws within taking care of their own homes and properties, in order to eliminate the criaderos. Further, people's lack of knowledge was described as a problem;

“My personal opinion is that people easily could avoid to invent the criaderos. But we are so poorly educated here in Costa Rica. And when people eat, they throw and throw and throw it away.” (Participant 7).
Most of the registered nurses described the problem as “the people don’t care”. With the increased amount of possibilities for the mosquitoes to breed, the disease will always be a problem, according to the registered nurses. The mutual view was that people need to stop producing criaderos, and that the progression of the disease is caused by people, or by “us” as one participant expressed. One registered nurse explained her view about the problem existing not from the disease itself, but from the people;

“Sometimes the problems is not so much the health, but the population and what the population understands.” (Participant 9).

One of the registered nurses, who has worked a long time with dengue care, expressed the problem when people lose the fear and respect for the disease;

“Over the years people has lost the fear of the disease and if you lose the fear of it, you will lose the respect of the disease. If so, the people will not care at home, and they will see it like a normal disease, like the flu.” (Participant 5).

**Caring**

This category covers the conceptions about the health care system in Costa Rica associated with dengue fever, and the registered nurses’ responsibilities and difficulties in caring, as well as one’s own feeling about providing the care. The category is divided into three subcategories.

**The health care system**

Some of the registered nurses had the opinion that Costa Rica has a good health care system, with good treatment and care for the patient. Two of the registered nurses also expressed that the dengue part of the hospital is well organized, with a lot of preventive measures. One of the participants explained how the planning of the dengue fever care is a constant task for the hospital, and that the preparation of the organization is of main importance when an outbreak occurs. The participants described a well structured care with protocols which are reviewed often, guides, checklists and a good communication with the doctors. Their opinion further was that the doctors and nurses were capable of handling the dengue situation.

“We know the sickness very well, and the treatment and how to do rehabilitation. Right now it is no problem.... ...for the health service. And it’s very little, very very little patients that die.” (Participant 8).

The picture given from the registered nurses was a well functioning dengue organization, despite this the participants also stated that the dengue outbreaks causes a strain on the health care. During the dengue outbreaks, the registered nurses described the lack of resources, such as space in the hospitals and possibilities to care for all the infected patients, due to a higher patient load. The high number of patients during an outbreak was a problem according to the participants;

“So it’s a difficult time all the time, cause we don’t know where to put these patients.” (Participant 1).
Nurses responsibilities

The registered nurses had a communal picture of their responsibilities regarding the care of the patient. They all explained how they in their work carefully observe for symptoms, and alarming signs. All the registered nurses described which controls and measurements they needed to perform, and what would be an alarming situation. The registered nurses brought up the need of continuous observation and the importance of monitoring the patients since they could go from a stable to a critical state in a short amount of time.

“A bad treated or bad, bad guarded dengue by the doctors or the nurses can cause a lot, of complications like death”. (Participant 5).

When the topic about one’s own feelings about the care and treatment of the patients was lifted all the registered nurses expressed that they feel comfortable in the treatment and like the close care that the dengue fever requires and all the focus and attention that is necessary;

“I really like the direct treatment with patients with dengue.” (Participant 5).

Complexity of the caring

Although the participants felt comfortable in providing the care, they also explained the complexity regarding the care for patients with dengue fever. Various difficulties were brought up. One difficulty described was that the symptomatic picture can vary from asymptomatic to a severe state with high fever, severe body pains and bleeding. One participant explained how the practice and theory differed within the disease:

“Every person is an individual, every person has different symptoms, it is not the same, the books or the practice.” (Participant 7)

In addition, the registered nurses described that it could be problematic with the results from the blood test of the platelets in comparison to the state of the patient. The patient could appear to be fine and feel well but have a very low platelet level, and on the other hand the patient could feel really unwell but have a normal level of platelets. For the registered nurses the blood test of the platelets is the ruling indication for planning of the care.

“When the patient arrives to the hospital it’s the most important and best indication of the state.” (Participant 9).

Another problem described was patients allergic to paracetamol, since there is no treatment for dengue fever, more than analgesic as paracetamol and fluids. Another complex situation was anemic patients or pregnant women since these conditions made the care more complicated. Further challenges were described as menstruating women since the sign of bleeding could be mistaken as a period. The participants had a consensus about the individuality of this disease concerning the symptomatic picture.
PATIENT EDUCATION

The registered nurses explained the importance of different aspects of education regarding patients with dengue fever, as well as educating the public in order to prevent the disease. This category is divided into three subcategories.

Community education

Some of the registered nurses explained that the ministry of health is responsible for the prevention in the society, and to look for criaderos in people’s houses, but that they as registered nurses in the hospitals also try to work preventive by educating their patients and their family about prevention actions they can take in their houses. They use means as brochures and leaflets to explain what needs to be done and what to avoid.

“We give education to the family and the patient.” (Participant 4).

Individual education

The registered nurses also implied that the education is individual and adapted for each patient. One participant described that he tries to guide the patients and explain what and how they can expect to feel while infected with dengue fever, and also to explain the medication the patient is to receive. To make the care and treatment more understandable to the patients, he used different ways to explain the situations to the patient, for example by using things that the patients recognized.

“When I explain I use a bottle as an example, which is something that people recognize.” (Participant 7).

Self-care at home

The registered nurses expressed that the ruling indication for hospitalization is the blood test of the level of platelets. When the test confirms a very low result hospitalization is required, even if the patient is close to asymptomatic. But when the patients have normal lab results, they need education about self-care to be able to stay at home. This requires the registered nurses to be educative, to teach their patients and explain to them about alarming signs and symptoms, and what to avoid. For example, as one of the participant explained, it is very important for the patient to know which analgesic to take, so they do not consume any medicine that could cause or worsen any bleeding. The registered nurses also explained the importance to understand the need of enough fluids and the reason why the patient should not ingest any red food items;

“...because when you have dengue you can bleed and if the person eats beet roots, afterwards the urine gets red, you don’t know if it is blood or from the beet root. The same if they vomit.” (Participant 7).

PREVENTION

Prevention is one of the fundamental parts within the health care, and a major field in the daily practice. This category concerns the topics about the view of prevention, such
as raising people's awareness as well as different means for prevention in society. This category includes two subcategories.

How to work with prevention

The mutual view of prevention concerned the importance to expand people’s awareness about avoiding to create criaderos in their houses and in the community. To eliminate the criaderos it is essential to educate people, before the dengue outbreak starts, on how to prevent and to make the population understand the prevention. Also, to have means for prevention and educate through television, brochures or informational leaflets. Besides that, some of the registered nurses thought that it is important to educate the children in the schools, to be able to change the next generations mindset. Two of the registered nurses further mentioned that it is necessary to construct and announce places where people can throw possible criaderos. Both during an outbreak, to make sure people stop producing criaderos and to improve the outcome, as well as before an outbreak starts, to prevent for the disease; 
“.... and then begin publishing places where people can throw whatever is an accumulation of water.” (Participant 3).

Difficulties within prevention

There were a variety of opinions on whether the prevention campaigns fulfilled its purpose. One of the registered nurses expressed that the prevention and the prevention campaigns were very good, but another participant thought that the prevention work was momentary and wished that it would be more constant. She, as well as the majority of the registered nurses, expressed a further need to develop the prevention, and to do this in people’s own homes and in the community instead of putting more strain on the already, sometimes economic burdened hospitals.

One registered nurse explained that one big problem in the prevention work is lack of economic resources. Instead of preventing in their homes, people come to the hospital to get information about prevention. According to her this is a big problem in Costa Rica because the people do not prevent in their own home.

“That is a problem for the country because the people don’t prevents for this.... on one side it is good, but on the other side, the people don’t prevent. The prevention here is zero.... the awareness that I have to prevent is zero.” (Participant 9).

THE FUTURE

The participants had a lot of opinions about the disease and the future. They discussed both difficulties within the future and opportunities to reach a change. They illuminated problems in the society as well as what factors that affects the disease. The recurring topic in this category as well as in the others, are the problems within people’s mindset, and their knowledge that needs to be changed in order to improve the outcome of this tropical disease. This category is divided into two subcategories.
Difficulties and opportunities

The registered nurses view of the disease and the future differed from a future possibly without dengue to a future that holds more obstacles. One of the registered nurses expressed that it would be nearly impossible to eliminate the disease because of the rain during the rainy season. When it rains the criaderos will be filled with water, which the mosquitoes can use as a breeding site.

One point of view was that the standard of living and the resources that one has, will affect the outcome. One registered nurse expressed her conception about the socioeconomic aspect of this disease; “It’s a little inevitable. Some people live very poorly. They have very little resources. Houses where there is a lot of cracks and the mosquitoes gets in. That’s why it is complicated.” (Participant 3).

The repetitive opinion was again the lack of awareness from people. “Well, I think it’s a disease that is difficult to eliminate most of all because some people are not aware or do not care.” (Participant 4).

Although, another registered nurse believed it might be possible to eradicate dengue fever since a lot of other infectious diseases have been eradicated previously. The future is described by the participant as a matter of the people, if people change their behavior and achieve a greater understanding the future can be changed. “So, nothing can be changed if the people don’t change.” (Participant 1).

What needs to be changed

There was a consensus that people's mindset needed to be changed. “People need to be conscious. And having the criaderos eliminated. If we never eradicate them, we will always have dengue.” (Participant 5).

The mutual view was that the future holds the issue of eliminating the criaderos and the responsibility lies within the society. If there is no criaderos, there is no place for the mosquitoes to reproduce and then the disease can be controlled. The registered nurses expressed that it is the people's responsibility not to create the criaderos, but some people are not aware, or do not take their responsibility. In order to achieve a change, and improve the future, the registered nurses highlighted an enhanced awareness about what creates the criaderos, and this is often a matter of where people choose to throw their garbage; “First we have to realize and maintain awareness of where we throw the garbage.” (Participant 7)

To be able to stop dengue fever, the participants pointed out the importance of cooperation in the community, more preventive campaigns from the government, space in the hospital to attend patients as well as more responsibilities taken by the people and an improvement in the cleaning of their homes and properties. It needs to be a change in the population’s lack of awareness regarding the importance of cleaning the houses and backyards to eliminate the criaderos, otherwise it will not be possible to eradicate the disease, according to the participants;
“As long as the people is not aware of the importance of cleaning the places, we will always have dengue. Always.” (Participant 2).

“I, as an individual person think that we should cooperate and if we can, we can have a clean community and a clean province and a clean country where there is no criaderos. That is the problem. And all over the world, around the world.” (Participant 7).

DISCUSSION

Discussion of method

There is limited or no research to be found of registered nurses’ views and experiences of caring for patients with dengue fever. This enhanced our interest of studying this area. Registered nurses’ views and experiences provide an important aspect in order to maintain high quality of the care. Since the aim was to describe registered nurses’ views and experience of caring for patients with dengue fever, a qualitative interview study was a suitable choice. By using interviews, one gets a good sense of the context. A qualitative content analysis was used since it is an established analysing method in nursing science and because it is suitable to interpret interview material. The authors have read and analysed all interviews together, which strengthens the reliability. During the analysis process the material was discussed and reflected upon back and forth between the authors to get a consistent interpretation of the results. While analysing, no meaningful units has been taking out of its context. All categories are illustrated with quotations from different participants to facilitate transferability of the results. The qualitative content analysis was conducted according to given instructions. The authors are satisfied with the results of the analysis and believe that it was an appropriate method to interpret the material. To establish trustworthiness the authors have had a reflective attitude during the whole process.

Strengths and limitations

Before the interviews were conducted the authors met a registered nurse at the ministry of health in San José, who worked in the dengue department. He explained how the Costa Rican health care system is constructed and financed, and how the dengue care organization works. It was important for us to have been provided this information before conducting the interviews to be able to understand the context. We were also well versed about the disease before the interviews and very interested in the subject. To be able to get a wide population, the interviews were performed in three different hospitals in different cities and provinces of Costa Rica. In addition there were also a good variety regarding the registered nurses age, sex and working experiences.

None of the authors had any previous experience of interviewing, which might have been a limitation. The interviews have been transcribed and we are aware of the possibility that the translation might not be exactly correct in every sentence since Spanish is not our first language. Although we do not believe that this has affected the result, as the translation process has been very thorough and allowed to be time consuming. Since we both speak basic Spanish we have been able to control and ensure the accuracy of the translation, which we believe have strengthened the credibility.
The interviews were conducted at the hospital where the registered nurses worked, as this seemed to be the natural place. On the other hand this might have had an impact on the interviews. Time was allocated for the registered nurses to conduct the interviews, although stress factors from the work environment might have had an influence. On the other hand it also made the interview more casual and they might have felt more comfortable.

The pre-understanding cannot be avoided and we have actively tried to override our pre-understanding, by using constant reflection. Despite this we are aware that our pre-understanding might have had an influence on the result.

**Discussion of the result**

The red thread during the interviews concerned the problem of people’s lack of knowledge both regarding the disease and the creation of criaderos. The participants described a ignorance among the citizens, about the seriousness of the disease. The registered nurses strongly emphasized the need for a change of peoples’ mindset. The focus remained on what makes a disease a problem in a community, and what to be done to change the outcome. Other pinpointed subjects were the importance of patient education to achieve good care and prevention to control the dengue fever and to reach sustainable development.

The authors believe that it is important to realize that dengue fever is a multidimensional disease and does not only cause of lot of suffering for the patients but also to the society. According to WHO (2009) dengue fever causes significant problems to the population in the endemic areas regarding health, economy as well as a social burden. The participants described the large patient loads as an economical burden on the health care system. We believe that the society would benefit from more preventive education and more organized education on self-care.

**The importance of individual care**

The participants illuminated that every person is different and therefore the care needs to be individual to encounter the patients’ needs. As a registered nurse it is essential that the given care is based on the patients’ perspective and life-world. As previously stated, this is strengthened by Dahlberg and Segesten (2010, pp. 126-128) who describes that the fundamental in the caring sciences is the patient perspective, which means that the patients’ life-world must be the focus of the care. The registered nurse needs to understand the patient’s life-world to be able to provide adequate care.

**Education**

The result showed the importance of the registered nurses educational role, both for self-care and prevention. Patient education is an essential part of the nursing profession and important in improving the patient outcome. It also increases patient autonomy, confidence in the self-care and decreases complications (Marcum, Ridenour, Shaff, Hammons & Taylor 2002). Didactics is a part discipline within the caring science and
means that the registered nurses need to be open-minded and responsive to the patient, and see the patient’s whole situation and thoughts (Ekebergh 2009, p. 30). The education to patients with dengue fever should include increasing the patient’s knowledge about the disease, how to prevent it and how to be able to perform self-care at home, by giving the patient different advice. The authors believe that it is of importance to give the patients who do not need to be hospitalized, more education on self-care, so that they can be able to stay at home, since there is no other treatment then fluids and paracetamol. If more patients could stay at home the burden on the health care system would be reduced. It is also highly important to educate the patients about preventive measures that they can take in their homes, in order to decrease the number of cases.

As Tither (2014) describes, a message map can be used as a communication tool to provide information. Even though information is important for people traveling to countries where dengue can be transmitted, this type of communication tool can also be used in countries where the dengue fever is endemic, to inform the community before an outbreak starts. A structured form of preventive information, at the right time, might play a crucial role in the outcome of infectious diseases like dengue fever and is important for the preventive part of the health care.

**Changing the mind of the people**

One main focus in the interviews was that the thinking and consciousness of people need to change in order to suppress and/or eliminate the disease. One of the participants brought up the example of starting with educating the young people in school to change the generations mindset. In a study by Jayawardene, Lohrmann, Youssefagha & Nilwala (2010) seventh-, eighth-, and ninth-grade students from two schools participated in a control and education program once a week for a total of eight weeks. After the intervention there was a great improvement in eliminating criaderos and disruption of the Aedes mosquitoes life cycle. If the school children are educated and involved this was shown to be a great asset in the preventive work and the education sector is believed to play an important role in the prevention. According to us, young people is a valuable group to influence for an improved prevention in any form of community bound problem.

**A greater responsibility for better prevention**

All the participants expressed how people showed great failure in performing the necessary care, as eliminating the criaderos and cleaning their houses. We believe that to control this disease it is very important that the community partake in the prevention, if not, the prevention will be ineffective. Pylypa (2009) encircles the great importance of the community's participation and also the effect of the community's perception on the disease. In Thailand the government has spent heavily economic resources on dengue fever prevention, but with an ineffective outcome since the participation from the public has been poor. We believe that no matter how much economic resources a government spend on prevention, the success is depending on the cooperation from the community. Pylypa (2009) also describes how challenging the domestic control of the mosquitoes has proven to be worldwide. The problem lies within encouraging the public to participate, and therefore the prevention of dengue is often deemed a failure,
worldwide, and the population of the Aedes mosquito continues to increase. To understand how the community perceive dengue is necessary to achieve a better success in prevention campaigns. This strengthens the authors believes that the educational prevention is essential as well as create a consciousness about preventive actions in order to create a sustainable development.

**Practical solutions**

As previously stated, people need to get involved in the prevention, however there was only one participant who focused on the responsibility on another, higher level. To be able to eliminate the criaderos the municipal and the government need to install places where people can throw all containers that collects water and have an organized waste collection. The problem is clearly the criaderos and peoples mindset but in order to improve the situation there must be possibilities to do so. Therefore, according to us, there must be better practical solutions as garbage disposal and collection, hence the problem is not only on the people.

One point of view, that did not emerged clearly through the result was the importance of preventive measures, such as using mosquito repellent and mosquito nets in order to decrease the number of cases, something that we would like to point out as necessary.

**CONCLUSION**

Dengue fever is a major problem, not only to the patients but also to the society. The disease creates a lot of suffering for the patients, and requires large financial resources. It has a socioeconomic aspect and is adversely affected by poverty and lack of education. To control the disease it is important with educational prevention actions to change peoples’ mindset.

The results of this study might be relevant to other vector borne diseases or problems in the community where education of the people and a change of the mindset is needed.

To our knowledge there is limited or no research to be found about nurses’ perspective on dengue fever. The authors encourage further research concerning the nurses’ perspectives on diseases like dengue fever to improve strategies and develop the care to work with more preventive actions.

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Anna-Karin & Carolina
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### Characteristics of the participants

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APPENDIX 2

Interview-guide

Before the interview the registered nurses will be able to read the questionnaire and have a chance to ask questions, this to eliminate their possible query. The questions include all types of dengue viruses (DENV 1- DENV 4), which will be explained to the participants.

(this is a guidance for us as interviewers, the informant will only receive the questions, all the questions will be open):

1. What is your views of dengue fever?
   Negative feelings, ex: as a threat, uncomfortable, painful, horrible.
   Neutral feelings, ex: very common, unexceptional, harmless.

2. What is your experiences of caring for patients with dengue fever?
   That’s interesting. Can you tell us more about that experience/situation?
   How did you feel during that moment?
   Ex: confident in actions and caring, confident with PM/guidelines, overwhelmed, scared, confused.

3. What are your responsibilities as a registered nurse in Costa Rica, when it comes to caring for patients with dengue?
   Structure, clarity
   uncertainty

4. Can you describe in what way the health care work with dengue fever, both in the acute phase and in preventive care?
   Difficulties
   Successes
   Opportunities
   Responsibilities
   You personally

5. What are your reflections of the future, and patients with dengue fever?
   Hopes/fears
   Ideas for improvements

6. Is there anything you would like to add?

Supplementary questions for the topics/questions
Can you please explicate this further?
In what way?
How do you feel about that?
What do you mean by that?