A Study Exploring the Knowledge, Attitudes and Practices of Young People Regarding Dengue Fever and the Extent of Community Involvement in Vector Control of the Disease in Trinidad and Tobago

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ABSTRACT

Objective: *This study intends to explore young people's knowledge, attitudes and practices regarding dengue fever in Trinidad and Tobago.*
Methods: *Interviews and focus groups were carried out with young people studying at the University of Trinidad and Tobago. Thematic analysis was then conducted on these scripts and recommendations for improvement were made.*
Results: *All participants had some knowledge about dengue fever; however, the extent of this knowledge varied greatly. Participants knew most about the mode of spread and symptoms. All participants did something at home as a means of vector control of the disease; ensuring no stagnant water was present in containers in the yard was the most popular method of vector control. All participants were aware that the government sprayed the neighbourhoods against mosquitoes; however, the majority thought they did not do this often enough.*
Conclusion: *Following the results of this study, three recommendations were made: the government should spray on a more regular basis, particularly just before the rainy season; a pilot study should take place investigating whether a fining scheme would improve vector control and dengue fever health education should be improved.*

Keywords: *Aedes aegypti,* community, dengue fever, vector control

Estudio Exploratorio de los Conocimientos, Actitudes y Prácticas de Personas Jóvenes con Respecto a la Fiebre del Dengue y Magnitud de la Involucración con la Comunidad en el Control del Vector de la Enfermedad en Trinidad y Tobago

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RESUMEN

Objetivo: *Este estudio persigue explorar los conocimientos, actitudes y prácticas de los jóvenes, con respecto a la fiebre del dengue en Trinidad y Tobago.*
Métodos: *Se llevaron a cabo entrevistas y se organizaron grupos focales con jóvenes que estudian en la Universidad de Trinidad y Tobago. Se realizó entonces un análisis temático a partir de estos guiones, e igualmente se hicieron recomendaciones para el mejoramiento.*
Resultados: *Todos los participantes tenían algún conocimiento sobre la fiebre de dengue, pero el grado de conocimiento variaba considerablemente de uno a otro. Los participantes sabían principalmente los síntomas de la enfermedad y la forma en que la misma se propaga. Todos los participantes tomaron alguna medida en sus casas como medio de control de vector de la enfermedad. El método más popular de control de vectores fue asegurarse de que no hubiera agua estancada en ningún recipiente en los patos. Todos los participantes conocían que el gobierno fumigaba los barrios contra los mosquitos. No obstante, la mayoría tenían la opinión de que no se hacía suficientemente a menudo.*
Conclusión: *A partir de los resultados de este estudio, se hicieron tres recomendaciones: el gobierno debe garantizar la fumigación se manera más sistemática, particularmente antes del período de lluvia;*

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debe hacerse un estudio piloto para investigar si un esquema de imposición de multas mejoraría el control de vectores y debe mejorar la educación par ala salud en torno a la fiebre del dengue.

Palabras claves: *Aedes aegypti,* comunidad, fiebre del dengue, control de vectores

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INTRODUCTION

Dengue fever is a neglected tropical disease, transmitted to humans *via* the *Aedes aegypti* mosquito, that has a considerable social, economical and public health impact on tropical developing countries all over the world (1). The illness contributes a significant burden of disease to the majority of countries in the Caribbean (2), and has been endemic in Trinidad and Tobago since 1991, with an incidence of 0.49 cases per 1000 in 2004 (3).

Individuals infected with dengue fever can experience symptoms including nausea, vomiting, rashes and aches and pains (2), but usually recover spontaneously. There is a more serious form of the disease known as dengue haemorrhagic fever [DHF] (4) which is characterized by an increase in vascular permeability, and if not treated promptly with fluid replacement therapy can result in a fatal hypovolaemic shock (5).

Presently, there is no vaccine available to protect against the dengue virus, however, development is currently ongoing (6). This means that the only way to prevent infection is through personal protection against mosquitoes and effective vector control of the *Aedes aegypti* mosquito (2).

It is vital that the breeding sites and larval habitats of *Aedes aegypti* are known so they can be targeted and effective vector control can take place. It has been found that these sites are generally water filled containers located outside, such as water tanks and discarded rain filled containers (2, 7, 8).

There are a number of methods that can be used to control the *Aedes aegypti*, for example the spraying of breeding sites with insecticides. A study by Chadee *et al* showed that if all possible breeding site containers were sprayed with temphos insecticide prior to the rainy season, then the transmission of the disease would be greatly reduced, more than if the containers were only treated during the rainy season (9, 10). Source reduction is also an effective method and involves removal of the breeding sites, for example removing water filled containers from the yard, and keeping grass levels low (11). Even though dengue fever is a diurnally transmitted disease one study has also shown that sleeping under insecticide treated bed nets (ITNs) is an effective preventative measure (12).

Community attitudes and the lack of involvement by the community have been significant factors contributing to the failure of vector control schemes (13−16). One study concluded that the community should be involved in both the development and implementation of vector control programmes in order for these schemes to reach their full potential, and improve their sustainability (14). Knowledge and awareness of the disease is also important with regards to recognizing the signs and symptoms so that prompt treatment can be sought, if necessary (2).

This study intends to explore young people's knowledge, attitudes and practices regarding dengue fever in Trinidad and Tobago, and to identify what measures, if any, the community takes toward vector control of the disease.

SUBJECTS AND METHOD

Ethical approval for this study was granted by the University of Leeds and the University of Trinidad and Tobago.

Qualitative methods were used to address the aims and objectives of the study. Ten interviews and three focus groups of six and eight people were conducted. The ages of participants ranged from 16−18 years. Two methods of data collection were used as this allowed triangulation of the results.

To obtain a sample of participants, convenience sampling was used, students from the University of Trinidad and Tobago were recruited as participants. A class was randomly selected and students who volunteered were asked to take part. Prospective participants were given a participant information sheet to read and were asked to sign a consent form if they wished to take part. The interviews and focus groups took a semi-structured approach, the questions were open ended, clear and neutral. A dictaphone was used to record the process. The audio recordings were transcribed to obtain a written script of the data that could then be analysed. The tape recordings and transcriptions were stored anonymously.

Thematic analysis was conducted to develop a coding frame that was then used to organize the data into themes. Once the scripts had been coded, similarities, differences and other relationships between the responses of the individual participants were noted. Finally, when all the data had been analysed, the results were written up so that conclusions could be drawn and recommendations made.

RESULTS

The interview and focus group transcriptions were divided into knowledge, attitudes and practice sections.

All but two of the participants knew that dengue fever was spread by mosquitoes, and half could name the species of mosquito, the *Aedes aegypti*, as the main vector.

All but one of the participants, interviewed individually, could name at least one symptom of dengue fever, and

four were able to name at least three symptoms. Within each of the focus groups at least four symptoms were named. Only one of the participants suggested an incorrect symptom.

The knowledge of dengue fever treatment was lacking. Seven participants from the interviews were unaware of what treatment consisted. Three of the participants who were interviewed individually and at least one person from each of the focus groups had some idea that the aim of treatment was rehydration therapy, and that patients are sometimes put on intravenous drips if they were severely ill. It was correctly mentioned on two occasions that if a patient with dengue fever is given aspirin then it could be fatal.

The knowledge of DHF amongst the participants was very limited. About half the participants said they had heard of it, and seemed to know that it was a more serious disease than classic dengue fever, but they were generally unaware as to what the main differences were.

The majority of the students agreed that dengue fever was a serious disease, as they were aware that it could be fatal. This did not, however, mean that it was something that they worried about. It appeared that people only worried about the disease if they had a family member or a friend who had suffered from the disease. Those participants who had not been affected by the disease said that they did not worry as they knew there were things that could be done to help prevent them from becoming infected.

All participants knew of ways that they personally could help prevent the spread of the disease. The most common practice mentioned was ensuring that there was no stagnant water in pots, tyres, or any other containers in their backyards or in their house. Other less common methods of vector control mentioned were cleaning of drains, cutting the grass and spraying the house in order to kill mosquitoes.

All of the participants said that the government sprayed the mosquitoes, however, there was a disagreement as to how often they came and whether that was enough. The majority of the participants said that on average spraying would be once or twice a year. The majority of the students thought that the government should spray the neighbourhoods more often. However, in one of the focus groups it was agreed that the government could not be faulted because if residents noticed an increase in mosquitoes in their area then they could call the vector control department and request spraying. The participants were also asked whether the government gave them any information about the disease, for example, what they could do at home as vector control methods to prevent the spread of the disease. Every participant stated that they had been given some form of information about dengue fever by the government. This could either be in the form of advertisements on the television, the radio, or in newspapers, and flyers. The majority of people said that the most common method of giving information would be through advertisements on the television.

When asked whether they had ever learnt about dengue fever in school, the students said they had, but that this was just through flyers being displayed around the school. It was generally agreed that all participants would be grateful for more information about the disease.

The participants were asked if the government could do anything else, besides giving out more information and spraying the neighbourhood on a more regular basis. One participant said that people who failed to keep their yards free of stagnant water should be fined.

DISCUSSION

The results of a study by Rosenbaum *et al* showed that there was a high awareness of dengue fever and that people thought of it as a serious disease (14), similar findings to these were provided by this study. In contrast, however, the Rosenbaum study stated that knowledge of the symptoms was lacking as 53.6% of participants could not name a single symptom (14). This suggests that knowledge of the disease has improved in the 16 years since the aforementioned study took place.

The Caribbean Epidemiology Centre recommends that for effective vector control of dengue fever, all non-essential water storage containers should be removed and all those that are essential should be covered, as they provide habitats for the *Aedes aegypti* mosquito to breed (17). The vast majority of participants in this study said that they practised this method of vector control at home.

With regards to the involvement of the government in vector control, the majority of students thought that more could be done. Previous studies have illustrated how vital it was for the government to involve the community in vector control of dengue fever, as lack of involvement has been a major contributing factor to vector control scheme failures in the past (13−16). It is therefore important that the community be satisfied with the government's efforts, however, at present that does not entirely seem to be the case.

A study in Haiti showed ITN to be an effective dengue vector control method (12). However, only one of the participants in this study said that they slept under a net. This suggests that there is a lack of awareness amongst the community as to the effectiveness of using ITNs as protection against dengue fever, or that there is a reluctance to use them.

Between the years of 2002 and 2004, the incidence of dengue fever in Trinidad and Tobago decreased from 5.05/1000 to 0.49/1000 of the population (3). The Breteau index (BI), however, increased suggesting that the decrease in cases of dengue fever was due to "herd immunity" and not vector control efforts. With the potential introduction of new serotypes of the virus and fading herd immunity, it is possible that Trinidad and Tobago could face an explosive epidemic in the future. It is therefore important that vector control efforts be stepped up and continuous surveillance strategies be in place (3).

Recommendations

A number of small-scale recommendations have been suggested, that could improve vector control of dengue fever in Trinidad and Tobago.

a) It should be made a priority that by the end of 2012, the government spray with insecticide at least twice a year in all areas, especially in the month before the start of the rainy season as this has been shown to be the most effective time to spray (10). The BI, house index (HI), container index (CI) and pupae per person index (PPI) should be calculated at the start and again when the policy has been in place for one year to measure whether it has been successful at reducing the population of the *Aedes aegypti* mosquito.

b) A pilot study should be carried out in a small high risk area of Trinidad and Tobago, to assess whether a fining scheme would improve vector control in the country. A team of health promotion officers should visit residents and inform them that to improve vector control of dengue fever and reduce spread of the disease then they must ensure no stagnant water is left in containers in their yard. The residents should be warned that if they did not adhere to this then they would face a fine. People should be given two months to meet these requirements and then the officers should return and carry out random spot checks over the following year, and fine anyone who has not met the requirements. Any fines collected should be used to help improve dengue vector control in the country. The BI, HI, CI and PPI should be calculated at the start of the study and again after six months. Cases of dengue fever should also be recorded. If a reduction in the indices and the cases of dengue fever is noticed then this scheme could slowly be rolled out over other high risk areas in the country.

c) Dengue fever health education should be improved. A health officer should visit every secondary school once a year and give a presentation to all the students informing them of what they could do to prevent the spread of the disease in their homes, what symptoms to look out for, and what to do if they suspected that they might have the disease. Following the implementation of this policy a similar study to this could be carried out amongst young people to assess whether knowledge of the disease has improved as a result of this policy.

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