

**AWARENESS OF RHEUMATIC HEART DISEASE PREVENTION AMONG
PRIMARY HEALTH CARE PROVIDERS AND PEOPLE AGED NINE YEARS
AND ABOVE IN KINONDONI MUNICIPALITY DAR ES SALAAM,
TANZANIA.**

Manase R Maria (MD)

**A Dissertation Submitted in Partial Fulfilment of the Requirements for the Degree
of Master of Medicine (Internal Medicine) of the Muhimbili University of
Health and Allied Sciences**

Muhimbili University of Health and Allied Sciences (MUHAS)

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CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by the Muhimbili University of Health and Allied Sciences (MUHAS), Dar es Salaam, a dissertation entitled: *Awareness of rheumatic heart disease prevention among primary health care providers and people aged nine years and above in Kinondoni municipality Dar es salaam* in partial fulfilment of the requirements for the degree of Master of Medicine (Internal Medicine) of the Muhimbili University of Health and Allied Sciences (MUHAS), Dar es Salaam

Dr Johnson M Lwakatare MB ChB

MRCP _____

Date _____



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I, **Maria R.Manase**, declare that, this dissertation is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

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ABSTRACT

Background:

Acute Rheumatic Fever (ARF) is an autoimmune consequence of infection with Group A β -haemolytic Streptococci (GAS). It causes an acute generalised inflammatory response and an illness that selectively affects the heart, joints, brain and skin. ARF leaves no lasting damage to the brain, joints or skin. However, damage to the heart valves, particularly the mitral and aortic valves, may persist after an acute episode has resolved. This involvement of the cardiac valves is known as Rheumatic Heart Disease (RHD), the most significant sequela of ARF. People who have had ARF previously are much more likely to have subsequent episodes, and these recurrences may cause further damage to the cardiac valves. Thus RHD steadily worsens in people who have multiple episodes of ARF. Early diagnosis and adequate treatment of GAS infection is an important initial stage in primary prevention of ARF as well as oral/IM penicillin for secondary prevention of ARF recurrent (secondary prevention of rheumatic fever). Despite significant morbidity caused by RHD, millions of people are unaware of having the disease and are not receiving secondary prevention.

Broad Objective: To determine awareness of RHD prevention among primary health care workers, and the community (non health care workers aged 9 years and above) in Kinondoni municipality, Dar es salaam, Tanzania.

Methods: A descriptive cross-sectional study was conducted at Kinondoni municipality. The study population was adults and children aged 9 years and above (community) and primary health care workers at selected health centres and dispensaries at Kinondoni municipality. Data collection was done by using self administered questionnaire addressed to assess awareness of clinical presentations of acute rheumatic fever, primary and secondary prevention of rheumatic fever and rheumatic heart disease. Collected data were analysed using SPSS Version 15

Results

The study recruited 740 people who were nine years and above, with their age range between 9 and 82, mean age 28.39(SD \pm 13.96) years. Females were 375 (50.7%), M: F ratio was 1:1.03. Also recruited 540 primary health care workers, age range between 20 and 63 years, mean age 37.04(SD \pm 8.603) years. Females 356 (65.9%)



M: F ratio was 1:2. The proportion of subjects' awareness on primary and secondary prevention of RF /RHD among non health care workers was low in most aspects, ranging between 12.0% and 31.0%. The overall proportion of subjects' awareness on RF /RHD among primary health care workers was good ranging between 60% and 89%.

Conclusion

A: For non health workers (community)

1. This study found generally low proportion of subjects' awareness (less than 30%) in all aspects of primary and secondary prevention of RF/RHD.
2. High level of formal education was associated with higher proportion of subjects' awareness in some aspects of RHD prevention, e.g. causes of sore throat, appropriate approach for treatment of sore throat and importance of regular follow-up.
3. Primary level of education was associated with higher proportion of awareness on association between sore throat and rheumatic fever and minimum recommended duration of monthly injection for rheumatic fever/rheumatic heart disease prevention.

B: For primary health workers

4. The proportion of awareness among primary health care workers was generally good in all aspects of primary and secondary prevention of RF/RHD.

Recommendations

1. Improve public health education on rheumatic fever and rheumatic heart disease prevention through the print, electronic mass media, involving community leaders, nongovernmental organizations and community health educators at Kinondoni municipality.
2. Kinondoni municipality should plan for municipal campaign emphasis on raising awareness on all aspects of RF/RHD prevention as it is in HIV/AIDS control
3. Establish municipal training courses/seminars for medical and paramedical workers in Kinondoni municipality on integrating prevention and treatment of rheumatic fever and rheumatic heart disease into primary health care facilities.



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LIST OF ABBREVIATIONS

- AIDS – Acquired Immunodeficiency disease syndrome
- AMO - Assistant Medical Officer
- ARF - Acute Rheumatic Fever
- CA - Clinical Assistant
- CHD - Congenital heart diseases
- CO - Clinical Officer
- CVD - Cardiovascular diseases
- ESR - Erythrocyte sedimentation rate
- GAS - Group A beta-haemolytic streptococci
- HIV – Human Immunodeficiency Virus
- MA – Medical Attendant
- NMW – Nurse Midwife
- NO - Nurse Officer
- PHCW - Primary Health Care worker
- PHN - Public Health Nurse
- RHD - Rheumatic heart disease
- URTI - Upper respiratory tract infection
- WHO - World Health Organization



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CHAPTER ONE

1.1 INTRODUCTION AND LITERATURE REVIEW

1.1.1. Background

Acute Rheumatic Fever (ARF) is an autoimmune consequence of infection with Group A β -haemolytic Streptococci (GAS). It causes an acute generalized inflammatory response, an illness that selectively affects the heart, joints, brain and skin. ARF leaves no lasting damage to the brain, joints or skin. However, damage to the heart valves, particularly the mitral and aortic valves, may persist after an acute episode has resolved. This involvement of the cardiac valves is known as Rheumatic Heart Disease (RHD). RHD is the most significant sequela of ARF. Although the exact causal pathway is unknown it seems that some strains of GAS are “rheumatogenic” and that a small proportion (3-5%) of people in any population has an inherent susceptibility to ARF.¹

People with a previous history of ARF are much more likely to have subsequent episodes, and these recurrences may cause further damage to the cardiac valves. Thus RHD steadily worsens in people who had multiple episodes of ARF.²

ARF is predominantly a disease of children aged 5-14 years and generally does not affect children less than 3 years old or adults.¹ However; people can have recurrent episodes well into their forties. The prevalence of RHD peaks in the third and fourth decades.¹

In 2005 Carapetis et al²⁶, published a summary of the major findings of an in depth review of the global burden of GAS diseases, performed for World Health Organization (WHO). From this review, they estimated that over 2.4 million children worldwide aged 5-14 years are affected with RHD. In addition, 79% of all RHD cases came from less developed countries. Furthermore, they estimated the annual number of ARF cases in children aged 5-14 years to be more than 336,000. This was extrapolated out of an estimate of 471,000 ARF cases in all age groups. Similar to RHD, they found that 95% of cases came from less developed countries.³

They estimated that 60% of all ARF cases will go on to develop RHD each year. They also estimated that, there are 1.88 million people with a history of ARF requiring



secondary prevention. Additional estimates indicate that 492,000 deaths per year occur due to RHD, with approximately 468,000 of these occurring in less developed countries.³

1.1.2. Diagnosis of ARF by Jones criteria

This requires two major criteria or one major and two minor criteria plus evidence of streptococcal infection. For example; positive throat culture, positive rapid antigen detection test, and elevated antistreptolysin O titre, or chorea alone.

1.1.3. Summarised Jones criteria for the diagnosis of Acute Rheumatic fever

Major criteria

1. Carditis –Means direct observation of cardiac tissue inflammation by using echocardiograph or presence of heart murmur or change in heart murmur (40-50%)
2. Polyarthrititis – Means painful swollen big joints e.g. knee joint, which migrates from one joint to another. (60-75%)
3. Chorea – Means occurrence of abrupt purposeless movement of the limbs without change in emotion (30%)
4. Erythema marginatum - Nonpruritic rash (1-3mm), slightly raised periphery and clear central skin occurs mainly on the trunk, thighs, and proximal limbs sparing face (<5%)
5. Subcutaneous nodules – Small (2mm) painless, round, firm, multiple on bone prominences, or extensor tendons without signs of skin inflammation (<10%)

Minor criteria

- Fever:-With no characteristic pattern, non specific, lasting for one week
- Arthralgia:-Painful joints(but not if arthritis is one of the major criteria)
- Previous history of ARF or RHD
- Acute-phase reactants
 - Raised erythrocyte sedimentation rate (ESR)
 - Raised C-reactive protein
 - Leukocytosis
- Prolonged PR interval:- In Electrocardiogram(ECG) (but not if carditis is a major criteria)



1.1.4. Primary prevention of ARF

Primary Prevention is defined as adequate antibiotic therapy for Group A β -haemolytic Streptococci (GAS), upper respiratory tract infection (URTI).⁴ Primary prevention consists of two components:

- Preventing susceptible individuals from GAS infection by improving living standards, personal hygiene and avoiding overcrowding.
- Proper treatment of acute GAS infection to reduce recurrence of ARF, administered only when there is GAS URTI.

Recommended drugs for the treatment of streptococcal pharyngitis are; - oral Penicillin V two or three times daily for 10 days, Amoxicillin once daily for 10 days, or intramuscular Benzathine penicillin as a single dose. For penicillin-allergic patients, it is recommended to use narrow-spectrum oral Cephalosporin, Clindamycin, or Clarithromycin for 10 days or Azithromycin for five days.⁵

The first component was used by developed countries to reduce GAS infection. This option is not easy in developing countries because of poverty, hence WHO advocates secondary prevention aimed at reducing recurrent attacks of ARF, thus reducing risks for developing RHD. This option has been shown to be effective in reducing the frequency of subsequent cases of ARF.^{4,6,7,8} However, as outlined in a WHO discussion paper of 2005, systematic screening and treatment of sore throats was not cost effective.⁹

1.1.5. Risk factors for ARF

Host factors:

ARF affects mainly children between 6 and 15 years, is uncommon in children under 5 years, and rare in children younger than 3 years. The frequency of the disease declines after puberty and is rare in adulthood.¹



Environmental factors

Overcrowding and poor access to health care, both linked to socioeconomic development, seem to be the most important determinants of disease distribution. Seasonal variations of GAS are not pronounced in the tropics¹⁰, in temperate climates, streptococcal infections have a peak in late winter and early spring.

1.1.6. Secondary prevention of ARF

This is defined as the continuous administration of specific antibiotics to patients with a previous attack of RF, or a well-documented RHD. The purpose is to prevent colonization or infection of the upper respiratory tract (URT) with group A streptococci (GAS) and the development of recurrent attacks of ARF¹¹.

The duration of secondary prevention depend on age of the patient, medical history, and socioeconomic factors.¹²

Category Duration for rheumatic fever prophylaxis:³³

1. Rheumatic fever with carditis and residual heart disease (persistent valvular disease)
 - Ten years or greater since last episode and at least until age 40 years or sometimes lifelong prophylaxis.³³
2. Rheumatic fever with carditis but no residual heart disease (no valvular disease)
 - Ten years or well into adulthood, whichever is longer.³³
3. Rheumatic fever without carditis
 - Five years or until age 21 years, whichever is longer³³

The World Health Organization (WHO) discussion paper from 2005 outlined that, of the available control strategies, secondary prophylaxis is the only one that has been shown to be both effective and cost-effective at community/population level, therefore, in populations with high prevalence of RHD, delivery of secondary prevention should be the major priority for control of GAS diseases.⁵

Case detection is an important starting point for both primary and secondary prevention of rheumatic fever/rheumatic heart disease, and an essential component of the Awareness



Surveillance Advocacy Prevention (A.S.A.P.) model for RF/RHD. In the absence of adequate case detection, the magnitude of the RF/RHD burden cannot be estimated accurately and undetected cases will not receive treatment and antibiotic prophylaxis. Maximised case detection within a community requires that all key members of the community be aware and alert to the risks and signs of both the preceding streptococcal pharyngitis and RF. Awareness must be highest among caregivers of children, teachers and health care workers, especially those likely to be the initial point of contact with the health care system ¹².

1.17. RF/RHD prevalence in Tanzania.

A review of cardiovascular diseases seen in Tanzanian hospitals between 1966 and 1968 using discharge diagnosis and cause of death in all hospital inpatients, revealed that heart disease caused a high proportion of hospital deaths.¹³ It has been reported to be amongst the ten common causes of death in hospitals, being the 9th in 1965, 4th in 1966, and 5th in 1967. Nearly 2% of all admissions were due to cardiovascular causes, of which 68% were due to congenital heart diseases, 22% hypertension and 10% rheumatic fever.¹³

In a study by Nhonoli¹⁴ on heart disease in Dar es Salaam, Tanzania in 1968, Rheumatic heart disease was the 3rd commonest cardiac condition.

Another study done in 1989 by T K Kazimoto¹⁵, on cardiac disorders among children aged one month to fifteen years at Muhimbili National Hospital (MNH), revealed that congenital heart diseases (77.6%), Rheumatic Heart Disease (16.8%), and cardiomyopathies (5.6%) were the most common heart diseases.¹⁵

In a study done by Nyawawa ETM et al¹⁶; one year experience of cardiac surgery at Muhimbili National Hospital, Dar es Salaam- Tanzania (2008-2009). which prospectively recruited all patients who underwent cardiac operation at the centre. The study revealed that of all cases of cardiac surgery performed, 47.6% were due to Rheumatic heart disease, congenital heart disease 35.2%, myxomatous valvular degeneration 16.2% and

pericardial disease 1%. Therefore, rheumatic heart disease was the leading cause of open heart surgery at Muhimbili National Hospital¹⁶.

1.1.8. ARF/RHD Awareness

1.1.8.1. Proportion of awareness of some aspects of RF/RHD prevention in various study populations.

Almost all studies done in various study populations revealed low proportions of awareness among study subjects in most aspects of rheumatic fever and rheumatic heart disease. In a study by Kasmaei P. et al;¹⁷ to determine mothers' knowledge on different aspects of RF, 500 mothers referred to healthcare centers in Guilan province were sought for the study. The study used a questionnaire to evaluate their knowledge on five different aspects of RF. Out of 443 respondents, 86% had good knowledge of treatment, 34% epidemiology, 4% symptoms, 27% route of infection, and 10.5% complications. More educated women had significantly better knowledge on RF. According to their findings, the author concluded that expanded health education is required to improve knowledge on ARF and RHD at community level¹⁷.

In a study done by S. Chadha, et al¹⁸, to determine RHD awareness, a questionnaire for the study was distributed to a group of 10-year-old schoolchildren at a primary school (A), $n = 30$, a group of patients attending cardiology out-patient clinic (B), $n = 30$, and a group of medical officers in a large university teaching hospital (C), $n = 30$, in Kuala Lumpur, Malaysia. Majority of participants in group A (74%) and 48% of group B suffered with pharyngitis in the last six months before study participation. In response to the question 'What did you do when you had a sore throat?' Five percent of group A and 14% of group B favoured seeing a general practitioner. With respect to the causes of sore throat, 74% of group A declared to know the cause of sore throat but only 4% of them said it was due to a causative organism, the others attributed it to a variety of causes including weather, food, etc.

In group B, 48% of the respondents declared to be aware of causes, with 30% demonstrating an understanding of the microbiological basis. Knowledge on the association between sore throats and rheumatic heart disease was 14% in group A and 30% in group B. Among the sources quoted for this information were medical



professionals (doctors and nurses) as well as the respondents' own reading. As to the treatment attitudes of medical practitioners, all 30 answered that they would treat the sore throats with an appropriate antibiotic and an accompanying antipyretic. The findings of this study suggest that the increased prevalence of rheumatic carditis in the sampled population is not related to under treatment by medical professionals but may be due to a basic lack of understanding amongst the public as to the cause of sore throats and its relationship to heart disease¹⁸.

1.1.8.2. Importance of health education on raising awareness of RF/RHD prevention

Ten years educational programme, done by Bach JF, et al¹⁹ in two French Caribbean Islands beginning in 1981 which sought to reduce the incidence of RF, provides evidence for the link between awareness and case detection. One year after implementing an educational campaign that consisted of widely distributed pamphlets and posters, television advertisements and educational videos, cases of RF increased by 10 - 20%. This increase was entirely attributed to an increased awareness of the disease in the community. The study also found that over the course of ten years educational intervention, the incidence of RF progressively declined in both islands by 74 - 78%. These findings support the argument that a community-based educational programme aimed at raising awareness of RF is essential for case detection and may be a critical first step in a comprehensive plan for RF/RHD control¹⁹.

In a study by Arya RK et al²⁰; to determine the awareness on sore-throat, rheumatic fever and rheumatic heart disease in a rural community India. The study was conducted in 74 villages of Chiraigaon block, Varanasi, during the period of March 1983 and December 1986. A before and after health education awareness survey on sore throat, rheumatic fever and rheumatic heart disease was carried out by interviewing 315 people by stratified random sampling. The study showed that there was significant increase in the knowledge on most of the symptoms, causes, consequences and preventive measures of sore throat, rheumatic fever and rheumatic heart disease. This paper highlights the importance of health education as a vital component of rheumatic heart disease control programme.²⁰



1.1.8.3. Proportions of awareness of regular secondary prophylaxis in various study populations.

In a study by Oli K et al²¹, estimating RHD prevalence among school children of a central Ethiopian rural town (Butajira), 92.8% of the entire schoolchildren (n = 3,235) were screened. Their mean age was 13.4 +/- 3.5 years. Fifteen children, accounting for a rate of 4.6/1000, were noted to have findings consistent with RHD. Only 2 of the 15 students (13.3%) were aware of their disease, and neither of them was on regular secondary prophylaxis. The authors concluded that lack of awareness about their disease noted among the cases is worrisome and deserves serious attention.²¹

In another study carried out by Oli K, Porteous J et al²², to assess the status of RHD prophylaxis among rheumatic heart disease patients, two third of the 9388 school children surveyed were found to have RHD. On interviewing parents of the children with RHD, ten acknowledged being informed of their children's cardiac illness. Of these parents, 9/60 (15%) had some idea that their children had heart disease related to some form of infection. However, only two of the nine (22%) children whose parents had some idea about their disease were on regular monthly benzathine penicillin prophylaxis in the previous 12 months preceding the interview. Three of the nine children (33%) had six or fewer injections in the 12 months preceding the interview. The remaining 4 parents (44%) reported that their children took treatment that included injections only at the time of initial diagnosis several years earlier and had no follow up since then. Their reasons for not seeking medical care for their children included lack of information on prophylaxis, inability to pay for the treatment and distance of the health facilities. Lack of awareness and extremely low rate of regular prophylaxis observed in this study highlighted the need for an urgent control programme that takes active case detection, treatment access and health education into consideration²².

In another cross-section study by Sadiq MI et al²³, to determine the prevalence of RHD among school children aged 5-15 years from 70 schools, in urban and semi urban areas of Lahore, Pakistan, children were screened by clinical examination by a team of cardiologists and diagnosis confirmed by echocardiography. Socio - demographic data was also collected. Of the 24,980 children screened, the prevalence of RHD was

21.9/1000. Most (92.5%) were unaware of the diagnosis and less than 2% were taking rheumatic prophylaxis. All children belonged to a low socioeconomic group and 67% of them were undernourished. The younger age of onset was a special feature and most of them were unaware of the diagnosis, and hence not receiving life-saving secondary prevention²³.

S F Rizvi et al²⁴, in his pursuit to determine the community based prevalence of rheumatic heart disease (RHD) in rural Pakistan, found that less than 20% of those found to have RHD were aware of their diagnosis before participation in the study, and only 8% were taking secondary prevention for RHD. Nearly all people with RHD were unaware and not receiving life saving secondary prevention including those who were aware of their diagnosis²⁴.

A study by Mohamed et al²⁵, in Egypt with the aim of providing a detailed description of the clinical profiles of rheumatic fever and rheumatic heart disease in children and study possible risk factors. Looked a total of 196 children aged 3.5 to 17 years. A first attack of RF was detected in 47 patients (83.9%), previous attacks of rheumatic fever were detected in 9 (15.1%), majority of them were not in regular secondary prophylaxis. The main causes of irregular or lack of use of secondary prophylaxis were lack of awareness of magnitude of the problem, and failure to access drug due to poverty.²⁵

A study done by Rauf-ur Rashid Kaul et al⁴¹: to determine the prevalence of rheumatic heart disease in school children (5-15 years) in rural block Srinagar. A total of 4125 school children from 54 schools, primary to high school of the said block were selected randomly. Data revealed that out of 4125 school children studied, 21 were found to be suffering from RHD (including 14 old and 7 new cases) giving a total prevalence of 5.09/1000. Out of 14 old cases who were already diagnosed, 9 cases (64.29%) were receiving secondary prophylaxis in the form of benzathine penicillin regularly, 4 cases (28.52%) were receiving some irregularly prophylaxis while one case was not receiving any prophylaxis at all (7.14%).⁴¹

In a study done by Bassilli et al⁴², the aim was to determine the profile of secondary prophylaxis among children with rheumatic heart disease in Alexandria Egypt. Two-thirds of the children (64.6%) were complying with their secondary prophylaxis



regimens. Non-compliance in one third was more common among children whose parents had lower level of education and occupation, those living in semi urban and rural areas, those whose parents had only fair to poor knowledge of the disease, those whose families were not satisfied with the health care provided and those managed at the students' health insurance hospital.⁴²

1.1.8.4. RF/RHD Prevention Physicians' proportion of awareness.

In a study done by S. S. Danbauchi, et al⁴³; evaluating the Spectrum of Rheumatic Heart Disease in Zaria, Northern Nigeria, of the 600 patients whose echocardiography scan was obtained, 47 had RHD. The referring physicians made a right diagnosis of RHD in 76% of all referred cases. Thirty two patients out of the 47 (68%) were on prophylactic penicillin (benzathine) monthly injection for prevention of rheumatic fever. Findings in this study showed that the awareness of RHD among physicians was 76% and secondary prevention of RF 68%. High prevalence of RHD was attributed to lack of facilities and low accessibility to primary health care centres⁴³

In a study by Katharine et al⁴⁴, to explore the extent to which current practices for the secondary prevention of rheumatic fever (RF) in Cape Town. A Physicians' questionnaire assessed awareness and adherence to the national guidelines. The evaluation revealed that patient knowledge on the disease was almost non-existent, however despite this lack of knowledge, adherence to secondary prophylactic treatment was good. Furthermore, the physicians most likely to encounter a case of rheumatic fever were least likely to be aware of and to comply with the national guideline. The author concluded that, since the publication of the national guidelines in 1997, little progress has been made towards achieving the implementation of a comprehensive programme for the secondary prevention of RF/RHD⁴⁴



1.2. PROBLEM STATEMENT

RF and RHD are still major medical and public health problems mainly in developing countries including Tanzania .These diseases affect an estimated 15 million people worldwide, with approximately 200,000 deaths annually, and hundreds of thousands of survivors are left disabled without access to the expensive medical and surgical care that the disease requires ¹².Incidence of RHD in Africa is estimated at 17-43% of all cardiovascular disease²⁶.

Roughly 2.4 million of school aged children are severely affected with RHD in Africa.One million of them live in sub-Saharan Africa ⁶. Prevalence of rheumatic fever was 10% of all patient with cardiovascular disease admitted in Tanzanian hospitals from 1966-1968¹³. Incidence of Acute Rheumatic Fever in Tanzania is estimated to be 11.9 per 1000 population²⁷.Majority (47.6%) of open heart surgeries done at Muhimbili National Hospital 2008/2009 were due to rheumatic heart disease.¹⁶

Lack of parental / guardian awareness of the causes, consequences and preventive measures of ARF/RHD is a key contributor to poor adherence amongst children on long-term prophylaxis. Raising awareness of RF/RHD among primary health care workers, parents / guardians, teachers and community at large is essential for case detection and may be a critical first step in a comprehensive plan for RF/RHD prevention.



1.3. RATIONALE

Over the last 150 years the developed world has experienced a dramatic decline in the incidence and prevalence of RF/RHD through improved living conditions and the wide spread use of penicillin for the treatment of GAS.³⁰

Although strategies for preventing ARF/RHD were proven effective a long time ago, ARF incidence in Tanzania is 11.9 per 1000 population and that of RHD is 4.3 per 100,000²⁷

RF and RHD are among the commonest causes of cardiovascular morbidity and mortality in developing countries³⁰. RHD is the second common cause of heart failure (after hypertension) in Africans and the commonest indication for cardiac surgery in tropical Africa, accounting for nearly 60% of open heart surgery²⁶.

Raising awareness was one of the tools used to reduce the disease incidence to the lowest level in Cuba and Costarica from 1986 through 2002.^{28,29}

The proportion of RF/RHD awareness in Tanzania has not been assessed. It is anticipated that, the results of this study will enlighten us on where we are in terms of awareness both in primary health care workers and the community at large. Basing on this study results, a strategic plan to alleviate the situation can be set so as to target primary and secondary preventions at the level of primary health care workers and the community.



1.4. OBJECTIVES

Broad Objectives

To determine the level of awareness of ARF and RHD prevention among primary health care workers and the community (non health workers) in Kinondoni municipality

Specific Objectives

1. To determine the level of awareness of ARF clinical presentation among primary health care workers at health centres and dispensaries in Kinondoni municipality
2. To determine the level of awareness of ARF clinical presentation among the community (non health care workers adults and children aged 9 years and above) in Kinondoni municipality
3. To determine the awareness of primary prevention of RF among primary health care workers at health centres and dispensaries in Kinondoni municipality
4. To determine the awareness of primary prevention of RF among the community (non health care workers adults and children aged 9 years and above) in Kinondoni municipality
5. To determine the awareness of secondary prevention of RF among primary health care workers at health centres and dispensaries in Kinondoni municipality
6. To determine the awareness of secondary prevention of RF among the community (non health care workers adults and children aged 9 years and above) in Kinondoni municipality



CHAPTER TWO

2.1 METHODOLOGY

2.1.1. Study design:

The study design was a descriptive Cross sectional study

2.1.2. Study area:

The study area was Kinondoni municipality in Dar es Salaam with a population of 1,083,913 by Tanzanian National Census 2002. Kinondoni District is made up of 4 divisions, 27 wards, and 113 sub-wards. The Primary health facilities consist of twelve health centres and 172 dispensaries.

2.1.3. Study population:

The study populations were primary health care workers and the community (adults and children aged 9 years and above) in Kinondoni municipality.

2.1.4. Study duration: The study was conducted between April and September 2010(six months)

2.1.5. Sampling technique

A: For non health workers: multistage cluster sampling was used as follows:

Stage one - Kinondoni municipality was selected by convenient sampling. Stage two -10 wards out of 27 were selected by simple random sampling. Stage three -1 street from each selected ward was selected by simple random sampling. Stage four -10 ten cell leaderships were selected from the selected street by simple random sampling. Stage five -7 houses were selected by simple random sampling from each ten cell leadership. Stage six – 1 household was selected from each selected house by simple random sampling. A total of 700 households were selected with an average of 1to 3 eligible individuals in each selected household. Stage seven - All eligible individuals in each selected household (including children aged 9 years and above) were then given self administered



questionnaires designed for the purpose of the study by the investigator. All study participants had to fill in the questionnaire independently under direct observation of the investigator.

B. For health workers: multistage cluster sampling was used as follows:

Stage one -Kinondoni municipality was selected by convenient sampling. Stage two -All twelve health centers were selected. Stage three -86 out of 172 dispensaries were selected by systematic sampling using a sampling interval of two. A total of 98 centres were selected, with an average of 4 to 6 eligible individuals from each selected health centre/dispensary. Stage four - All eligible primary health care personnel working at the health centre or dispensary at the Outpatients Department (OPD) or medical & pediatric wards in each selected health centres & dispensaries were given self administered questionnaire designed for the purpose of the study by investigator. Each study participant had to fill in his/her questionnaire independently under direct observation of the investigator.

2.1.6. Sample Size Calculation

Two different sample sizes were calculated due to different levels of awareness among the community (non health care workers)and primary health care workers, using the formula: $N = z^2 pq / E^2$

N= Sample size,

z= % point corresponding to significant level of 5%=1.96

P= Percentage of awareness of ARF/RHD (14%) among non health care workers (community)

Q = 100-P

E= Maximum likely error = 0.25 (2.5%)

Sample size for non health care workers (community)

Percentage of awareness $p=14\%$ ¹⁸

$N = 1.96^2 \times 14 \times (100-14) / 2.5^2$,

N= 740.045

Total sample size for the community (non health care workers) = 740

**Calculation of sample size for primary health care workers:**

Percentage of awareness of RF/RHD among physicians $p = 76\%$ ⁴³

E= Maximum likely error = 0.36 (3.6%)

$$N = 1.96^2 \times 76(100-76)/3.6^2$$

$$N = 540.6696$$

Total sample size for primary health care workers = 540

Total study population = calculated sample for health care workers + calculated sample size for the community (non health care workers) $540 + 740 = 1280$

2.1.7. Inclusion criteria**Non health care workers (community)**

All children aged 9 years and above, and adults aged 18 years and above living in selected households at Kinondoni municipality who consented to study participation were included

Health care workers

All health care worker aged 18years and above with the following qualifications: Assistant Medical Officer (AMO), Clinical Officer (CO), Clinical Assistant (CA), Nurse Officer (NO), Nurse Midwife (NMW), Public Health Nurse (PHN), and Medical Attendant (MA) working at the selected health centre or dispensaries at Outpatient Department, medical & pediatric wards were included in the study after consenting to participate in the study.

2.1.7. Exclusion criteria

All individual who were incapable of reading and write were excluded.

Health care workers who had less than one year medical training course were excluded.

2.1.9. Data collection**For non health care workers:**

All eligible individuals in each selected house hold had to consent to study participation.

For children aged 9 to 17 years consent was obtained from parents or guardians. A total



of 740 eligible individuals were selected, and given self administered questionnaire structured for the purpose of the study by the investigator. The respondent had to write 1 for true/yes options and 2 for false/no options, or leave blanks if not aware. Few questions enquired the interviewee to mention cause of sore throat or drugs used to treat his/her sore throat, in a space provided. Socio-demographic characteristic like age, gender, occupation, and level of education were also included. Each individual had to fill in his/her questionnaire independently under direct observation of the investigator. Children and elderly were given some assistance by the data collector during questionnaire filling. Filled in questionnaires were then collected by the investigator for analysis.

For primary health care workers:

In each selected health facility, the in charge of health services or health facility owner had to consent to his/her facility participation, followed by consent from each eligible worker. A total of 540 eligible individuals were recruited. Self administered questionnaire structured for the purpose of the study were then distributed to each individual by the investigator. Each interviewee had to fill in his/her questionnaire independently. Apart from ARF/RHD prevention knowledge assessment, social demographic data like age, gender, level of education, and question inquiring on the cadre of the profession i.e. AMO, CO, CA, NMW, PHN, NO and MA was also included. The respondents had to write 1 for true/yes options, 2 for false/no options in a space provided, or to leave blanks if no knowledge. Few questions required interviewee to mention cause of sore throat or recommended drugs used to treat a patient with sore throat. Filled in questionnaire were then collected by the investigator for analysis.

2.1.10. Data analysis

Physical check-up was performed on each questionnaire, followed by data entry, and data analysis by using the statistical package for social sciences (SPSS) version 15. Summary statistics and frequency tables were produced.

2.1, 11. Ethical issues

Information about the study objectives, aim, and anticipated advantages was explained to all participants. A written consent was obtained from all participants prior to recruitment



into the study and for children guardian/parental consent was obtained. All participants' information was kept confidential.

2.1.12. Ethical clearance

Ethical clearance was sought from the ethics clearance board of the Muhimbili University of Health and Allied sciences (MUHAS). Permission to conduct the study at Kinondoni municipality was sought from the Kinondoni municipality director.



CHAPTER THREE

3.1. RESULTS

3.1.1. Socio-demographic characteristic of the study population non health care workers (community N=740) and Primary health care workers (N=540)

Table 1 shows socio-demographic characteristic of the two study populations non health workers (community N=740), and Primary health care workers (N=540).

3.1.1.1. Socio-demographic characteristics for non health care workers (community)

The study recruited 740 non health care workers, their age ranging between 9 and 82, with a mean age of 28.39(SD \pm 13.96) years. Females were 375 (50.7%) and males 365 (49.4%), with a M: F ratio of 1:1. The majority (77.2 %) of the study population was young, aged between 9 and 39 years old. Over half of the study population 415 (56.1%) had primary school level of education, 28% had secondary school level of education, few (15.9%) had post-secondary school level of education. Regarding occupation, majority (45.4%) had informal employment, 40% were not employed (children 22.6% and older students 7.4%, house wives 10.4%) and only 14.6% of the non health care workers had formal employment.

3.1.1. 2. Socio-demographic characteristics for health care workers

The study also recruited 540 primary health care workers who were eighteen years old and above, with their age ranging between 20 and 63, mean age of 37.04(SD \pm 8.603) years. Females were the majority 356 (65.9%), M: F ratio was 1:1.93. A large proportion were young adults between 30 and 39 years (39.3 %). Nearly half of the study population 263 (48.7%) had post secondary school level of education, 46.3% had secondary school level of education, few (5.0%) subjects had primary school level of education. Majority of those who had primary school level of education were medical attendants.

With regard to cadre of profession, the majority were medical attendants 131 (24.1%), clinical officers 106(19.6%), clinical assistants 13.7%, public health nurses 13.2%, nurse midwives 10.9%, nurse officers 10.7 % and assistant medical officers 7.6%. Among clinicians majority were clinical officers (19.6%) and clinical assistant (13.7%), with few assistant medical officers (7.6%).

Table 1: Socio - demographic characteristics of the study populations community (non health workers) N = 740 & primary health care workers (PHCW) N=540

Variables for the study populations	Non health workers (community) N = 740	Percent	Primary health care workers (PHCW) N =540	Percent
Age:				
9 – 19	211	28.5	0	0
20 – 29	182	24.6	110	20.3
30 – 39	178	24.1	212	39.3
40 – 49	101	13.6	164	30.4
50 +	68	9.2	54	10.0
Sex:				
Female	375	50.7	356	65.9
Level of education:				
Primary school	415	56.1	27	5.0
Secondary school	207	28.0	250	46.3
Post secondary	118	15.9	263	48.7



Figure1: Distribution of occupation for non health workers (community)

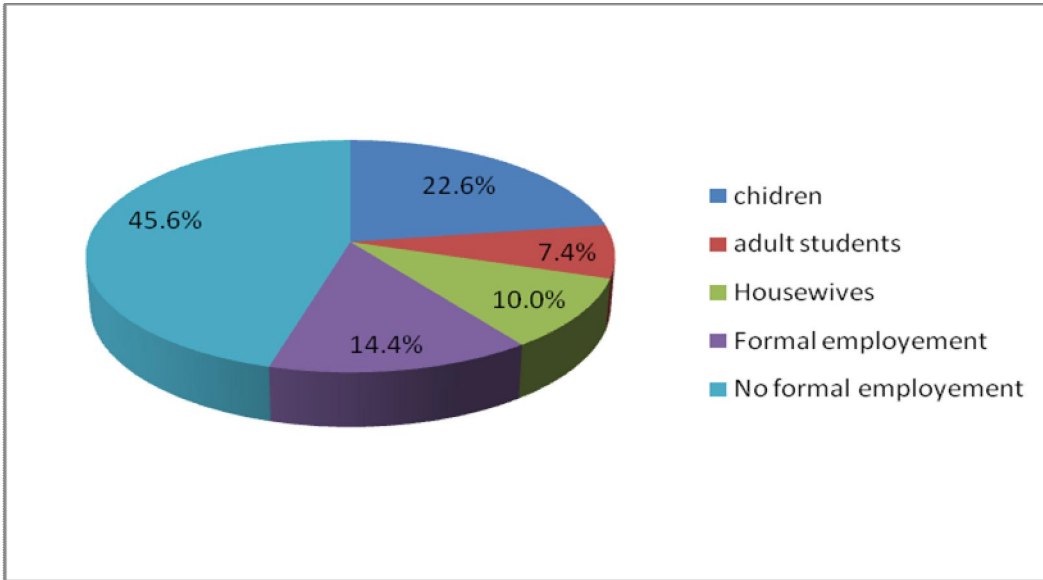
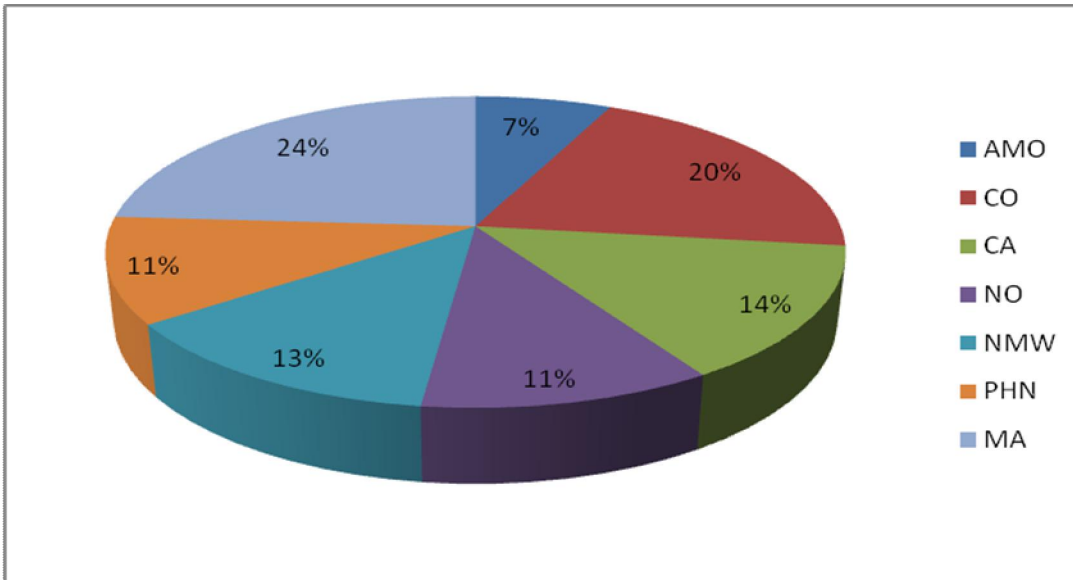


Figure2: Distribution of primary health care workers by cadre of profession



Key: AMO- Assistant Medical Officer, CO- Clinical Officer, CA- Clinical Assistant, NO –Nursing Officer, NMW – Nurse Midwife, PHN – Public Health Nurse, MA – Medical attendants.

All AMO had secondary education +, 5% of primary health workers had primary school education. Of those who had primary school level of education medical attendants were the majority.

3.1.2. Awareness of primary prevention of RF/RHD.

Table 2 shows the proportion of subject awareness on causes of sore throat in relation to gender, age, and level of education among study populations (community 740 and primary health care workers 540).

The overall study subjects awareness on the cause of acute sore throat among 740 non health care workers (community) recruited was 12.8% .Majority, 645 (87.2%) of non health care workers were not aware of bacteria being the causative organism of sore throat. The proportion of study subjects awareness was generally low in both sexes though the proportion of awareness on actual cause of sore throat was slightly higher among females non health care workers 67 (17.9%) than in their males counterparts 28 (7.7%). When level of education was taken into account, over half 53.3% of those who had post secondary school education were aware of the cause of sore throat, followed by secondary school level (7.2%) primary school level of education (4.1%). This finding demonstrated the influence of education on awareness of causes of acute sore throat, higher level of formal education being associated with higher proportion of subject awareness. When age was taken into consideration the highest proportion of subject awareness 69 (35.4%) was found among those aged between 30 and 39 years. None of the respondent aged 50 years and above mentioned bacteria as a causative organism of sore throat.

Awareness on causes of acute severe sore throat was also assessed among primary health care workers. The overall awareness of bacteria being the causative organism of sore throat among primary health care workers was 327 (60.6%) out 540 respondents. More than one third 213 (39.4%) were not aware. Majority 134 (72.8) of the males health care workers and over half 193(54.2%) of the females health care workers were aware of bacteria being the causative organism of acute sore throat. The highest proportion of subjects awareness was found among respondents aged fifty years and above 41(75.9%). There was no much difference in proportions of awareness among levels of education, though post secondary school (60.8%) and secondary school (60.8%) levels of education had slightly higher proportion of subjects' awareness than primary school level of education (56.6%).

Table 2: Awareness of causes of acute sore throat among study populations (community N =740 &PHCW N=540)

Non health workers (community)		Primary health care workers N= 540	
Variables	Awareness in %	Variables	Awareness in %
Total 740	95 (12.8%)	Total 540	327(60.6%)
Sex		Sex	
Male	28(7.7%)	Male	134(72.8%)
Female	67 (17.9%)	Female	193(54.2%)
Age groups(years)		Age groups(years)	
9 – 19	6(2.8%)	20 – 29	63(57.3%)
20 – 29	16(8.8%)	30 – 39	128(60.4%)
30 – 39	63(35.4%)	40 – 49	95(57.9%)
40 – 49	10(9.9%)	50+	41(75.9%)
50+	0 (0%)		
Level of education		Level of education	
Primary school	17 (4.1%)	Primary school	15 (56.6%)
Secondary school	15(7.2%)	Secondary school	152 (60.8%)
Post secondary School	63 (53.4%)	Post secondary School	160 (60.8%)

Table 3 shows the proportion of subjects awareness on association between sore throat and rheumatic fever/ rheumatic heart disease among study populations (community N= 740 & PHCW N = 540) by age, gender, and level of education. The overall subjects awareness on association between sore throat and rheumatic fever /rheumatic heart disease was 106 (14.3%), out of 740 non health care workers (community) recruited. Majority 634(85.7%) of non health care workers (community) were not aware of the association between sore throat and rheumatic fever /rheumatic heart disease. The proportions of subject awareness among females and males were generally low 14.9% and 13.7% respectively. All age groups had low proportion of subject awareness, the

highest proportion (23.8%) of awareness was found among those aged 40 to 49 years old, and the lowest proportion (8.8%) was found among those aged fifty years and above. Thus young age was not a contributing factor for the overall low proportion of awareness among non health care workers (community). The highest proportion (15.9%) of subject awareness was found among the respondent with primary school level of education, followed by those who had secondary school level of education (15.5%) and the lowest proportion was found among study participant who had post secondary level of education (6.8%). This finding is contrary to the reality but could be explained by the fact that, primary school children are at the highest risk of developing RF/RHD, some were on regular monthly injection, majority of them declared that they know someone with RF on regular monthly injection. Based on this information, it was assumed that those with a disease got information from health care workers and they spread it to their friends. This finding suggest that health education on association between sore throat and RF/RHD is needed to the community at large regardless the level of formal education attained by individuals in the community.

When awareness of association between sore throat and rheumatic fever was assessed among primary health care workers: The overall proportion of subjects awareness on association between sore throat and rheumatic fever/rheumatic heart disease was 395 (73.1%) out of 540 primary health care workers respondents. Minority 145 (26.6%) of primary health care workers were not aware. Two third (67.4%) of females and more than eighty percent (84.2%) of males were aware of association between sore throat and rheumatic fever/rheumatic heart disease. Higher proportion of subjects awareness among males was attributed by the fact that majority of them were clinicians hence more knowledgeable than nurses. There were no much differences in proportions of subjects awareness among all age groups although the highest proportion (77.4%) of subject awareness was found among those aged 40 to 49 years, and the lowest proportion (69.8%) of awareness was found among those aged 30 to 39 years. Majority (79.5%) of study participants with post secondary school level of education were aware of association between sore throat and rheumatic fever/rheumatic heart disease, followed by those with secondary school level of education (69.2%) and primary school level

education had the lowest proportion (48.1%). Therefore higher level of formal education was associated with higher proportions of subject awareness on association between sore throat and rheumatic fever/rheumatic heart disease.

Table 3: Awareness of association between sore throat and rheumatic fever among study populations (community N=740&PHCW N=540)

Non health workers (community) N =740		Primary health care workers N = 540	
Variables	Awareness in %	Variables	Awareness in %
total 740	106 (14.3%)	total 540	395 (73.1%)
Gender		Gender	
Male	50 (13.7%)	Male	155 (84.2%)
Female	56 (14.9%)	Female	240 (67.4%)
Age groups (years)		Age groups(years)	
9 - 19	25(11.8%)	20 – 29	80 (72.7%)
20 – 29	34(18.7%)	30 – 39	148 (69.8%)
30 – 39	17 (9.6%)	40 – 49	127 (77.4%)
40 – 49	24(23.8%)	50 +	40 (74.1%)
50 +	6 (8.8%)		
Level of education		Level of education	
Primary school	66 (15.9%)	Primary school	13 (48.1%)
Secondary school	32 (15.5%)	Secondary school	173 (69.2%)
Post secondary school	8 (6.8%)	Post secondary school	209 (79.5%)

Figure 3 shows the proportions of subject awareness on causative organisms of sore throat and association between sore throat and rheumatic fever by cadre of profession among primary health care workers. The proportions of subject awareness on causative organism of sore throat among different cadres of profession were almost similar, although slightly higher proportion was found among clinical officers (74.5%) and the lowest proportion of awareness was found among public health nurses (43%), proportions of other cadres of professions were as follows, sixty three percent of AMO, 70.2% of CA,



63.7% of NO, and 61.9% of NMW respectively. Only 43% of public health nurses were aware of bacteria being the causative organism of sore throat, this finding need serious attention because these nurses are the one dealing with prevention of diseases in primary health facilities hence, on working seminars/training are required to improve awareness among primary health care workers.

When proportion of subject awareness on association between sore throat and rheumatic fever was assessed by cadre of personnel, majority (95.1%) of Assistant medical officers were aware of association between sore throat and rheumatic fever followed by CA (89.2%) and CO (85.8%). This result shows that over 85% of clinicians were aware of the association between sore throat and rheumatic fever, higher cadre of profession was associated with higher proportion of subject awareness on association between sore throat and rheumatic fever/rheumatic heart disease.

Figure 3: Awareness of cause of sore throat and association between sore throat and rheumatic fever by cadre of profession



Key: AMO- Assistant Medical Officer, CO- Clinical Officer, CA- Clinical Assistant, NO –Nursing Officer, NMW-Nurse midwife, PHN – Public Health Nurse, MA – Medical Attendant

Table 4 shows awareness on importance of adequate treatment of sore throat for prevention of RF/RHD among study populations (community N = 740 & Primary health care workers N = 540).



The overall proportion of subject awareness on importance of adequate treatment of acute sore throat for the prevention of rheumatic fever /rheumatic heart disease was 169 (22.8%) out of 740 non health care workers respondents. Majority 571(77.2%) of non health workers were not aware of the importance of adequate treatment of sore throat for rheumatic fever/rheumatic heart disease prevention. When age and sex was taken into consideration, there were slight difference in proportions of subject awareness among males 20.5% and females 94 (25.1%). The highest proportion 63 (29.9%) of subject awareness among all age groups was found amid those who were aged 9 to19 years, followed by 40 to 49 years 45 (27.7%). This result has opposed the reality but could be explained by the susceptibility of the age group to RF/RHD, may be they got information about the importance of adequate treatment of sore throat for prevention of RF/RHD from attending doctor during treatment of sore throat. When level of education was taken into consideration 123 (29.6%) of those who had primary school level of education were aware, 37 (17.9%) of those who had secondary school level of education and 9 (7.6%) of those who had post secondary school level of education, hence primary school level of education constituted the highest proportion of subject awareness than other levels of education, this finding can be explained by the same explanation as above.

When proportion of subject awareness on the importance of adequate treatment of sore throat for RF/RHD prevention was assessed among primary health care workers, majority 435 (80.6%) out of 540 Primary health care workers were aware of the importance of adequate treatment of acute sore throat for prevention of RF, 105 (19.4%) were not aware. Over seventy percent (77.8%) of females and 85.9% of males were aware of the importance of adequate treatment of sore throat for RF/RHD prevention. Young adults (20 to 29) comprised the uppermost proportion (84.5%) of awareness of the importance of adequate treatment of sore throat for rheumatic fever/rheumatic heart disease prevention, among all age groups. When level of education was taken into consideration, the highest proportion of subject awareness (86.7% was found among those with post secondary school level of education followed by secondary school (76.0%) and the lowest was found among primary school level of education (63.0%). Thus higher level of formal education was associated with higher proportion of subject awareness on the

importance of adequate treat of sore throat for prevention of rheumatic fever and rheumatic heart disease.

Table 4: Awareness of importance of adequate treatment of sore throat for prevention of RF/RHD among study populations (community N=740& PHCW N=540)

Non health worker (community) N = 740		Primary health care workers N = 540	
Variables	Awareness in %	Variables	Awareness in %
Total 740	169 (22.8%)	Total 540	435 (80.6%)
Gender		Gender	
Male	75 (20.5%)	Male	158 (85.9%)
Female	94 (25.1%)	Female	165 (77.8%)
Age groups(years)		Age groups (years)	
9 – 19	63 (29.9%)	20 – 29	93 (84.5%)
20 – 29	45(24.7%)	30 – 39	165 (77.8%)
30 – 39	21 (11.8%)	40 – 49	137 (83.5%)
40 – 49	28 (27.7%)	50 +	40 (74.1%)
50 +	12(17.6%)		
Level of education		Level of education	
Primary school	123 (29.6%)	Primary school	17 (63.0%)
Secondary school	37 (17.9%)	Secondary school	190 (76.0%)
Post secondary	9 (7.6%)	Post secondary school	228 (86.7%)

Table 5 show the proportion of subject awareness on recommended treatment of sore throat for the prevention of rheumatic fever for those who ever had sore throat among



people aged 9 years and above at Kinondoni municipality N=352 and PHCW who ever treated patient with sore throat N=540.

A total of 352 (47.6%) non health workers had sore throat, the overall proportion of penicillin usage and hospital treatment among non health worker who ever had sore throat was 107(30.4%), two third 245 (69.6%) of those who had sore throat did not use recommended drugs for treatment of sore throat. Majority of those who did not use recommended treatment, used other drugs (e.g. analgesics, cough syrups etc), local herbs, hot water and some of them were not treated at all. One third (34.9%) of females and 54(27.0%) of males used penicillin and hospital treatment. Nearly half 32 (47.8%) of those at age group 20 to 29 years used penicillin and hospital treatment. More than eighty percent 79 (83.2%) of those at age group between 9- 19 did not use penicillin or hospital treatment, though was the age group at high risk of developing rheumatic fever. This finding is bothersome therefore health education is needed to parent/guardians on importance of appropriate treatment of their children's sore throat. Forty two percent (42.6%) of those who had post secondary school level of education used penicillin for treatment of sore throat, as well as 35 (31.8%) of secondary school, and 49 (26.1%) of primary school level of education, hence post secondary school level of education constituted the highest proportion of penicillin or hospital treatment usage among all levels of education. Therefore higher level of formal education was associated with high proportion of subject awareness.

When awareness of recommended drug for treatment of acute sore throat for the prevention of RF/RHD was assessed among primary health care providers, the overall proportion of recommended drugs usage for treatment of acute sore throat among primary health care workers recruited was 94.8%. Only few 28(5.2%) of primary health care workers were unaware. Over ninety percent (96.2%) of males and females (94.1%) were aware of recommended drug for the treatment of acute sore throat; the proportion of subjects with awareness was almost similar among males and females, though males had higher proportion of awareness than females. The highest (98.8%) proportion of subject who were aware of recommended drug usage for the treatment of acute sore throat among primary health workers was found among those who were aged between 40 to 49 years



old followed by those who were aged 20 to 29 years old (97.3%), and the lowest (90.7%) proportion of subject awareness was found among those who were aged 50 years old and above. When awareness of recommended drug for treatment of acute severe sore throat was assessed among different levels of education, the highest proportion (96.6%) of subject awareness was found among those who had post secondary school level of education. Thus advanced age and higher levels of formal education were associated with higher proportions of recommended drugs usage among primary health care workers. This findings suggest that low proportion of subject awareness on recommend drugs found among non health workers was not due to ignorance of primary health care workers, rather was due to lack of health seeking behavior among the community.

Table 5: Awareness of appropriate treatment of sore throat for those who ever had sore throat among non health workers (community) and PHCW who ever treated sore throat (Community N =352 & PHCW N =540)

Non health worker (community) N = 352		Primary health care workers N = 540	
Variables	Penicillin	Variables	Penicillin
Total 352	107 (30.4%)	Total 540	512 (94.8%)
Gender		Gender	
Male	53 (34.9%)	Male	177 (96.2%)
Female	54 (27.0%)	Female	335 (94.1%)
Age groups (years)		Age groups (years)	
9 – 19	16(16.8%)	20 – 29	107 (97.3%)
20 – 29	32 (47.8%)	30 – 39	194 (91.5%)
30 – 39	20 (27.4%)	40 – 49	162 (98.8%)
40 – 49	23 (39.0%)	50+	49 (90.7%)
50+	16 (27.6%)		
Level of education		Level of education	
Primary school	49((26.1%)	Primary school	26 (96.3%)
Secondary school	35 (31.8%)	Secondary school	232 (92.8%)
Post secondary school	23 (42.6%)	Post secondary school	254 (96.6%)



Figure 4; shows Proportion of subject awareness on the importance of adequate and appropriate treatment of sore throat for the prevention of RF/RHD by cadre of professions. Majority of primary health care workers were aware of the importance of adequate treatment of sore throat for rheumatic fever/rheumatic heart disease prevention, the highest proportion was found among Assistant Medical Officer 92.7%, followed by Clinical Officers 88.7%, and Clinical Assistant 87.8%,and nurses proportions of awareness ranged between 75 % and 81%.This result show that more than 75% of all health worker responded to that question were aware of importance of adequate treatment of sore throat for prevention of RF/RHD.

Regarding awareness of appropriate drug for treatment of sore throat, more than 90% of primary health care workers were aware of penicillin being a drug of choice for the treatment of acute sore throat, the highest proportion of subject awareness (93%) was found among AMO, and the lowest proportion (43%) was among NO. Therefore clinicians had higher proportion of awareness of recommended drug for treatment of sore throat.

Figure 4: Proportion of awareness of importance of adequate and appropriate treatment of sore throat for prevention of RF/RHD by cadre of personnel



Key: AMO-Assistant Medical Officer, CO- Clinical Officer, CA- Clinical Assistant, NO –Nursing Officer, NMW – Nurse Midwife, PHN – Public Health Nurse, MA – Medical Attendant

3.1.3. Awareness of secondary prevention RF/RHD.

Table 6 shows the proportion of subject awareness of the minimum recommended duration of monthly injection for prevention of rheumatic fever/rheumatic heart disease among study populations (community N = 740 & PHCW N = 540).

The overall proportion of subject awareness of the minimum recommended duration for monthly injection for the prevention of rheumatic fever and rheumatic heart disease was generally low 186 (25.1) among 740 non health workers study participants. Majority 554 (74.9%) of non health care workers were unaware of recommended duration of monthly injection for the prevention of rheumatic heart disease. Twenty five percent 94 (25.1%) of female and 92 (25.2%) of male were aware. When age was taken into consideration the highest proportion 86(40.8%) of subjects with awareness was found among those in age group 9 to 19 years followed by those in age group 20 to 29 (22.5%). When level of education was taken into account, the proportion of subjects with awareness among primary school level of education was the highest 130 (31.3%) followed by that of 42 (20.3%) secondary school level of education and the lowest proportion 14 (11.9%) was found among those with post secondary education. These findings are contrary to the reality but can be explained by the fact that children and young adult are at high risk of developing rheumatic fever /rheumatic heart disease, majority of them declared to know someone on regular monthly injection, some of them were on monthly injection during data collection period hence higher proportion of awareness than other age groups.

When awareness of the minimum recommended duration of monthly injection for rheumatic fever and rheumatic heart disease prevention was assessed among primary health care workers, the overall proportion of subjects awareness was 336(67.8%) out of 540 respondents. Less than forty percent 174 (32. 2%) of health care workers were not aware. Over sixty percent (67.1%) of females and 69.0% of males were aware of the minimum recommended duration of monthly injection for rheumatic fever/rheumatic heart disease prevention. When age and level of education were considered, the proportion of awareness among study subjects ranged between 59% and 70%, though the highest proportion (70.7%) of awareness was found among subjects aged between 40 to 49 years old and those who had post secondary level of education (70%). Although the

majority of health care workers were aware, 32.2% of them were not aware, this finding is worrisome hence need on working seminars/trainings to educate all primary health care workers on the minimum recommended duration of monthly injection for the prevention of RF/RHD, for better achievement in the prevention of rheumatic fever /rheumatic heart disease.

Table 6: Awareness of minimum duration recommended for monthly injection for Prevention of RF/RHD among community N =740 & PHCW N = 540

Non health worker (community) N = 740		Primary health care workers N = 540	
Variables	Awareness in %	Variables	Awareness in %
Total 740	185 (25.1%)	Total 540	366(67.8%)
Gender		Gender	
Male	92 (25.2%)	Male	127 (69.0%)
Female	94 (25.1%)	Female	239 (67.1%)
Age groups (years)		Age groups (years)	
9 – 19	86 (40.8%)	20 – 29	69 (62.7%)
20 – 29	41(22.5%)	30 – 39	144 (67.9%)
30 – 39	22 (12.4%)	40 – 49	116 (70.7%)
40 – 49	19 (18.8%)	50 +	37 (68.5%)
50 +	18 (26.5%)		
Level of education		Level of education	
Primary school	130 (31.3%)	Primary school	16 (59.3%)
Secondary school	42 (20.3%)	Secondary school	166 (66.4%)
Post secondary school	14 (11.9%)	Post secondary school	184 (70.0%)

Table seven shows the proportion of subjects awareness on the importance of regular follow-up after initial treatment of rheumatic fever for the prevention of recurrent rheumatic fever/rheumatic heart disease among study populations (community N = 740 &PHCW N =540).

The overall awareness on the importance of regular follow-up after initial treatment of rheumatic fever for the prevention of recurrent rheumatic fever/rheumatic heart disease was 529 (71.5%) out of 740 non health care workers (community) respondents, 211 (28.5%) were unaware. This finding show that the majority of the study participants were aware of importance of regular follow-up after initial treatment of rheumatic fever, therefore health care workers need only to direct the community on frequency and duration required for each particular patient. More than two third 299 (79.7%) of females, and males 230 (63.0%) were aware of the importance of regular follow-up after initial treatment of rheumatic fever. The result signifies that females had high proportion of awareness than males. When age and level of education were considered 163 (77.3%) of those aged 9 to 19 years old, and 99 (83.9%) of those who had post secondary school level of education were aware. Therefore youngest age group as well as post secondary level of education was associated with higher proportions of awareness.

When awareness on the importance follow-up after initial treatment of acute rheumatic fever for the prevention of RF/RHD was assessed among primary health care workers, 439(81.3%) out of 540 respondents were aware of the importance of regular follow-up after initial treatment of rheumatic fever for the prevention of rheumatic heart disease, 101(18.7%) were unaware. Eighty five percent of the males and 79.2% of the females were aware of the importance of regular follow-up after initial treatment of rheumatic fever for the prevention of rheumatic fever recurrence and rheumatic heart disease. The age group 30 to 39 had higher proportion (86.3%) of awareness than other age groups. Secondary school level of education had a slightly higher proportion (82%) of subject awareness than other levels of education.

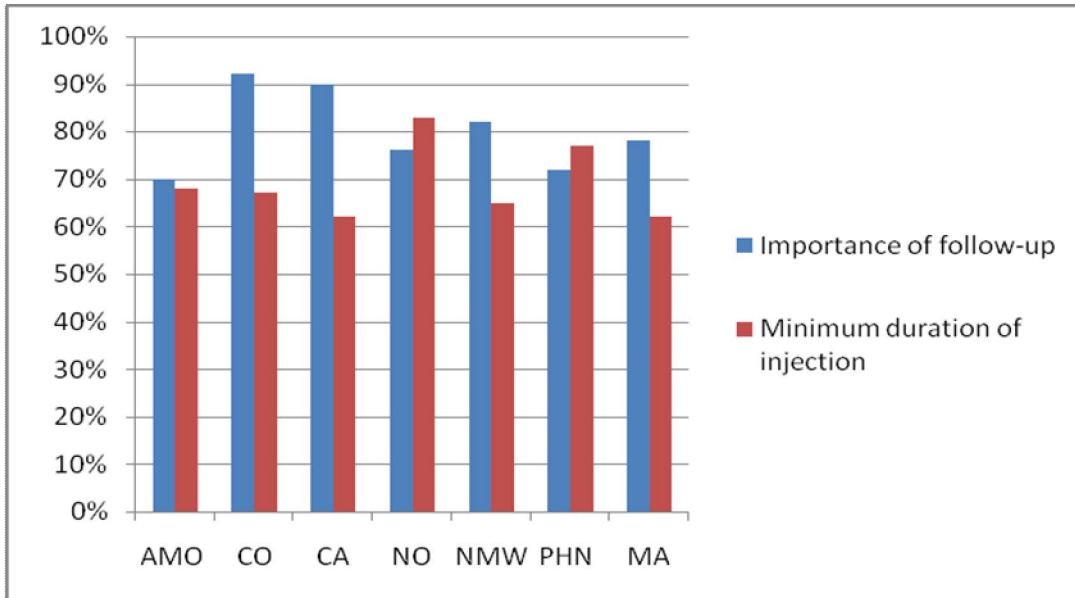
Table 7: Awareness of importance of follow-up after initial treatment of RF in by age, gender, and level of education among community N =740 & PHCW N=540

Non health worker (community) N = 740		Primary health care workers N = 540	
Variables	Awareness in %	Variables	Awareness in %
Total 740	529 (71.5%)	Total 540	439 (81.3%)
Gender		Gender	
Male	230 (63.0%)	Male	157 (85.3%)
Female	299 (79.7%)	Female	282 (79.2%)
Age groups (years)		Age groups (years)	
9 – 19	163 (77.3%)	20 – 29	87 (79.1%)
20 – 29	101 (55.5%)	30 – 39	183 (86.3%)
30 – 39	130 (73.0%)	40 – 49	125 (76.2%)
40 – 49	73 (72.3%)	50+	44 (81.5%)
50+	62 (91.2%)		
Level of education		Level of education	
Primary school	309 (74.5%)	Primary school	21 (77.8%)
Secondary	121 (58.5%)	Secondary	205 (82.0%)
Post Secondary	99 (83.9%)	Post Secondary	213 (81.0%)

Figure 5: Awareness of the importance of follow-up after initial treatment of acute rheumatic fever and minimum recommended duration of monthly injection for the prevention of RF/RHD by cadre of profession. Over sixty percent of study participants in each cadre of profession were aware of minimum recommended duration for monthly injection for prevention of RF/RHD. There were no much differences in proportions of awareness among cadres of professions. The lowest proportion was found among AMO's. However, awareness between sore throat and rheumatic fever was highest among AMOs' Regarding importance of follow-up after initial treatment of acute rheumatic fever for prevention of RF/RHD, majority of cadres of professions had proportion of awareness

above seventy percent, the highest proportion was found among Clinical Officers (92.5%), followed by Clinical Assistant (90.5%) and the lowest proportion was among Assistant medical Officers (70.7%)

Figure 5: Awareness of importance of follow-up after initial treatment of acute rheumatic fever and minimum recommended duration for monthly injection for prevention of RF/RHD



Key: AMO- Assistant Medical Officer, CO- Clinical Officer, CA- Clinical Assistant, NO –Nursing Officer, NMW – Nurse Midwife, PHN – Public Health Nurse, MA – Medical Attendant

The proportions of subjects with awareness of the minimum recommended duration of monthly injection among most cadres of profession ranged between 60% and 80% hence a reasonable number of health care workers were not aware of the minimum duration recommended for monthly injection for the prevention of RF/RHD. Therefore ongoing seminars are required for all cadres of profession on minimum duration recommended for monthly injection for the prevention of RF/RHD for better achievement on RF/RHD prevention.



Table 8a shows the proportion of subject awareness on clinical presentation of acute rheumatic fever according to age, sex and level of education among people aged 9 years and above at Kinondoni municipality(non health care workers).

The overall proportion of subject with good knowledge among non health care workers was low 165 (30.5%). More than half 394 (53.2%) of the non health care workers had moderate knowledge, and 120 (16.3%) had poor knowledge on clinical presentation of rheumatic fever. Thirty seven percent of females and 23.0% of males had good knowledge on clinical presentation of rheumatic fever. When age was considered the supreme proportion (42.7%) of good knowledge was found among those aged 30 to 39 followed by those aged 9 to 19 years (32.8 %), though this was the youngest age group in the study population. This finding shows that the overall low proportion of good knowledge was not attributed by younger study participants. When level of education was taken into consideration nearly half, 58 (49.2%) of those who had post secondary school level of education had good knowledge on clinical presentations of rheumatic fever followed by those with primary school level of education (29.6%), and the lowest proportion of good knowledge was found among those with secondary school level of education (21.7%).

Professional knowledge cannot be obtained through higher level of formal education alone; therefore health education on clinical presentation of rheumatic fever is required for the community at large regardless of the different levels of formal education among individuals in the community.

Table 8a: Level of awareness on clinical presentation of rheumatic fever according to age, gender, and level of education among non health workers (community N=740).

Variable for community N = 740	Poor knowledge	Moderate knowledge	Good knowledge
Gender			
Male	80 (21.9%)	201 (55.1%)	84 (23.0%)
Female	40 (10.7%)	193 (51.5%)	142 (37.9%)
Age groups(years)			
9 – 19	21 (10.0%)	122(57.8%)	68 (32.2%)
20 – 29	99 (37.9%)	72 (39.6%)	41 (22.5%)
30 – 39	15 (8.4%)	87 (48.9%)	76 (42.7%)
40 – 49	8 (7.9%)	69 (68.3%)	24 (23.8%)
50+	7(10.3%)	44 (64.7%)	17(25.0%)
Level of education			
Primary school	49 (11.8%)	243 (58.6%)	123 (29.6%)
Secondary school	65 (31.4%)	97 (46.9%)	45 (21.7%)
Post secondary school	6 (5.1%)	54 (45.8%)	58(49.2%)

Key – Poor knowledge means - the study participant could not mention any RF Symptom, moderate knowledge means –the study participant mentioned One to two symptoms of RF, and good knowledge means – the study Participant mentioned three or more symptoms of RF

Table 8b shows the level of knowledge on clinical presentation of rheumatic fever among primary health care workers, the overall proportions of subjects with good knowledge on clinical presentations of rheumatic fever among primary health care workers was 336 (62.2%) out of 540 study participants, 117 (32.8%) had moderate knowledge, and 27 (5%)

had poor knowledge. The proportion of good knowledge on clinical presentation of rheumatic fever among those aged 20 – 29 years old was (72.7%); it was the highest proportion of good knowledge among all age groups. Those who had post secondary level of education comprise the uppermost proportion (66.2%) of good knowledge among all levels of education, followed by those who had primary school level of education (59.3%) and the lowest proportion (58.4%) of awareness was found among those with secondary school level of education.

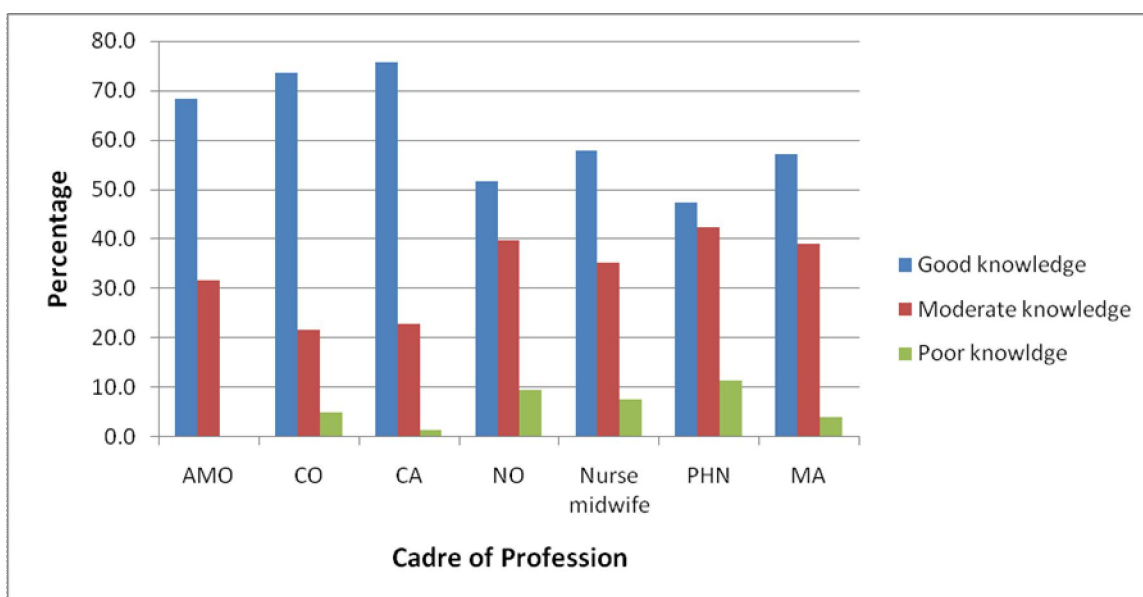
Table 8b: Level of awareness on clinical presentation of rheumatic fever among Primary health care workers (N=540).

Variable for health workers (N = 540)	Poor knowledge 27(5.0%)	Moderate knowledge 117 (32.8%)	Good knowledge 336 (62.2%)
Gender			
Male	5 (2.7%)	56(30.4%)	123 (66.8%)
Female	22 (6.2%)	121 (34.0%)	213 (59.8%)
Age groups (years)			
20 – 29	0 (0%)	30 (27.3%)	80 (72.7%)
30 – 39	5 (2.4%)	79 (37.3%)	128 (60.4%)
40 – 49	12(7.3%)	47(28.7%)	105 (64.0%)
50 +	10 (18.5%)	21 (38.9%)	23 (42.6%)
Level of education			
Primary school	2 (7.4%)	9 (33.3%)	16 (59.3%)
Secondary school	10 (4.0%)	94 (37.6%)	146 (58.4%)
Post secondary school	15 (5.7%)	74 (28.1%)	174 (66.2%)

Key – Poor knowledge means - the study participant could not mention any RF Symptom, moderate knowledge means –the study participant mentioned One to two symptoms of RF, and good knowledge means – the study Participant mentioned three or more symptoms of RF

Figure 6 shows proportions of subjects knowledge on clinical presentation of ARF among primary health care workers by cadre of profession. Clinical assistants had the highest proportion (75.7%) of good knowledge, followed by clinical officers (73.6%) and AMO (68.3%) respectively. Proportions of nurses with awareness were less than 60%, the result show that more than 67% of clinician had good knowledge on clinical presentations of the rheumatic fever.

Figure 6: Proportion of subjects with awareness on clinical presentations of Rheumatic Fever among primary health care workers by cadre of personnel



Key: AMO- Assistant Medical Officer, CO- Clinical Officer, CA- Clinical Assistant, NO –Nursing Officer, NMW – Nurse Midwife, PHN – Public Health Nurse, MA – Medical Attendant

Table 9 shows the level of knowledge on clinical presentation of acute sore throat among primary health care workers at health centre and dispensaries in Kinondoni municipality according to age, sex and cadre of profession.

A total 540 primary health workers were recruited, the proportion of good knowledge on clinical presentation of acute sore throat was 475 (88.0%), 63 (11.7%) had moderate knowledge and very few 2 (0.3%) had poor knowledge. Therefore the overall proportion of good knowledge among primary health care workers was generally good 475 (88.0%) only 2 (0.3%) of primary health care workers had poor knowledge .169 (91.8%) of males,

and 306 (80.6%) of females had good knowledge. When age groups were assessed, the highest proportion of good knowledge was found among those at age group 20-29 years (92.7%), followed by 40- 49 years (90.9%) and 50 years and above (90.7%) respectively. Those who had post secondary level of education comprise the uppermost proportion (90.9%) of good knowledge on clinical presentations of acute sore throat. Therefore higher level of formal education was associated with high proportion of good knowledge on clinical presentation of acute sore throat among primary health care workers.

Table 9: The level of knowledge on clinical presentation of acute sore throat among study population by age, sex and cadre of profession

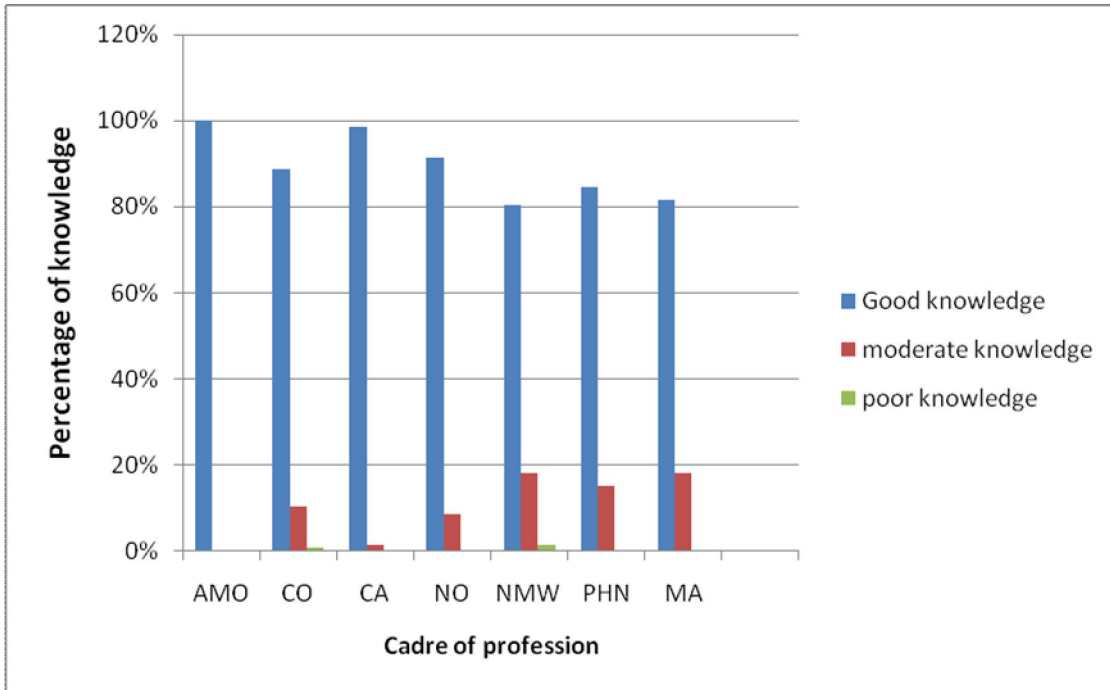
Variables for health workers (N = 540)	Poor knowledge 2 (0.4%)	Moderate knowledge 63 (11.7%)	Good knowledge 475 (88.0%)
Gender			
Male	1 (0.5%)	14 (7.6%)	169 (91.8%)
Female	1 (0.3%)	49 (13.8%)	306 (86.0%)
Age groups (years)			
20 - 29	1(0.9%)	7 (6.4%)	102 (92.7%)
30 – 39	1 (0.5%)	36 (17.0%)	175 (82.5%)
40 – 49	0 (0%)	15 (9.1%)	149 (90.9%)
50 +	0 (0%)	5 (9.5%)	49 (90.7%)
Level of education			
Primary school	0 (0.0%)	3 (11.1%)	24 (88.9%)
Secondary school	1 (0.4%)	37 (14.8%)	212 (84.8%)
Post secondary school	1 (0.4%)	23 (8.7%)	239 (90.9%)

Figure 7 shows the proportion of knowledge on clinical presentations of acute sore throat among different cadres of profession. All 41(100%) AMO's had good knowledge clinical presentation of acute sore throat, followed clinical assistant (98.0%), NO (91.4%), and

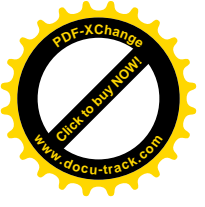


CO (88.7%) respectively. Therefore higher cadre of profession was associated with high proportion of subjects with good knowledge on clinical presentations of acute sore throat.

Figure 7: Proportion of awareness on clinical presentation of acute sore throat among primary health care by Cadre of profession



Key: AMO- Assistant Medical Officer, CO- Clinical Officer, CA- Clinical Assistant, NO –Nursing Officer, NMW- Nurse Midwife, PHN – Public Health Nurse, MA – Medical Attendant



CHAPTER FOUR

4.1. DISCUSSION

4.1.1. Study population

This cross sectional study describes the proportion of subjects with awareness on rheumatic fever/rheumatic heart disease prevention among the community (non health workers aged 9 year and above) and primary health care workers in Kinondoni municipality.

4.1.2. Awareness of RF/RHD prevention among non health workers (community)

In this study the overall proportion of subjects with awareness on rheumatic fever and rheumatic heart disease prevention among non health care workers was found to be low in most aspects of Rheumatic fever /rheumatic heart disease prevention.

4.1.2.1. Awareness of primary prevention of RF/RHD among non health workers (community).

Majority of the study participants, (87.2%) were not aware of the cause of sore throat, they attributed it with other things like cold drinks, ice cream, dust, smoke and certain foods like fish. Only 12.8% of the respondents were aware of bacteria being the causative organism of sore throat. Only 17.9% of the females and 7.7% of the males were aware of bacteria being the causative organism of sore throat, all age groups had relatively low proportion of subjects with awareness, the highest proportion (35.4%) was found among those aged between 30 to 39 years old, and the lowest (2.8%) was among those aged between 9 and 19 years, none of the respondent aged 50 years and above were aware of the causative organism of sore throat. Over half (53.4%) of those who had post secondary level of education were aware of bacteria being the causative organism of sore throat.

Hence higher level of formal education was associated with higher proportion of awareness on causes of sore throat.

These findings are comparable to those of Kasmaei P. et al¹⁸ to determine mothers' knowledge on different aspects of ARF, 500 mothers were referred to a healthcare centre in Guilan. In that study 27%, were aware of the causes of rheumatic fever, slightly higher than current study awareness (12.8%), the difference is thought to be due to the fact that those mothers were referred to that centre due to their children's diagnosis of rheumatic fever, hence expected to be more aware compared to current study population which was from the general population. In another study by Oli K et al¹⁷ the proportion of study subjects with awareness of causes of rheumatic fever/RHD among parents were 15% which is similar to current study findings.

S. Chadha, et al²⁰ in Kuala Lumpur, Malaysia found a much lower percentage (4%) of subjects with awareness on causes of sore throat compared to current study findings. This difference may be explained by the different study populations. Only ten years old school children were studied. Those were children compared to current study which recruited both children and adults.

The proportion of awareness of association between sore throat and rheumatic fever was generally low (14.3%). Primary school level of education constituted the higher proportion (15.9%) of awareness among all levels of education. This finding was contrary to the expectations whereby those with higher level of education would be expected to be more knowledgeable. The explanation for this finding could be the fact that, primary school children are at highest risk of developing RF/RHD, some were on regular monthly injections during data collection, majority of them declared to know someone with RF on regular monthly injections. Basing on this information it was assumed that those with the disease got information from health care workers and spread it to their friends at school.

There were no significant differences in proportion of awareness among age groups and gender. These results were similar to those of a study done by S. Chadha, et al²⁰ in Kuala Lumpur, Malaysia.

In this study the proportion of awareness of adequate treatment of sore throat for the prevention of rheumatic fever and rheumatic heart disease among respondents was

22.8%. The majority of the study participants (87.2%) were not aware of the importance of adequate treatment of sore throat for the prevention of RF/RHD. Twenty five percent (25.1%) of females and 20.5% of males were aware. The uppermost percentage (29.9%) of awareness was found among those aged between 9 and 19 years old, this was the youngest age group in current study population, this finding is opposing the reality where by advanced age thought to be more knowledgeable than young age, the finding could be explained by the susceptibility of the age group to RF/RHD, information on the importance of adequate treatment of sore throat for the prevention of RF/RHD may have been acquired from attending doctor during treatment of sore throat. Twenty nine percent (29.6%) of those who had primary school level of education were aware, which was the utmost proportion of all levels of education, this also is contrary to the reality but can be explained as above.

In this study the proportion of awareness of appropriate treatment of sore throat for rheumatic fever prevention was found to be low (30.4%). Over half (69.5%) of those who ever had sore throat did not use penicillin or seek medical treatment, most of them used local herbs, honey and warm salty water, few of them used analgesics and cough syrups, others were not treated at all. Majority of those who did not use penicillin for treatment of acute sore throat were aged 9 to 19 years. This age group was the group at high risk of developing rheumatic fever compared to other age groups in the study population. This result reveals a dismal situation in the community which needs some effort to change the attitude of parents toward appropriate treatment of their children's sore throat. This finding was higher than that of the study by S. Chadha, et al²⁰ in Kuala Lumpur, Malaysia. The difference could be due to different study populations, in that study the author recruited ten year old school children, while current study both children aged 9 years and above and adults.

4.1.2.2. Awareness of secondary prevention of RF/RHD among non health workers (community).

In this study the proportion of subjects with good knowledge on clinical presentation of rheumatic fever was found to be low (30.5%). Thirty seven percent (37.9%) of females' subjects and 23% of males' subjects had good knowledge on clinical presentation of rheumatic fever. This higher proportion of subject with good knowledge on clinical



presentation of ARF among females could be explained by the fact that females are the main care givers in most African families and in most cases are the one accompanying children to hospital hence vital information on the clinical presentation of rheumatic fever from doctors and sick children is most likely first received by females. More than half of the study population (53.2%) had moderate knowledge on clinical presentation of rheumatic fever and 16.3% of the study participants had poor knowledge on clinical presentations of acute rheumatic fever. The age group that constituted the highest proportion (37.9%) of good knowledge was 20 to 29 years, followed by those aged fifty years and above (10.3%) and 9 to 19 years (10%).

Current study findings were different from that of Kasmaei P. et al¹⁸. In that study the proportion of good knowledge of rheumatic fever symptoms was 4%, which was very low compared to current study (30.5%). The difference could be explained by the difference in study populations. In the previous study the author recruited only mothers, while in the current study males, females and children were recruited. Furthermore, majority of those who had good knowledge of rheumatic fever symptoms in current study were the young age group (9 – 29). The higher proportion found in this study may be contributed by children due to the fact that they're at higher risk of developing rheumatic fever.

The proportion subject awareness on importance of regular follow-up after initial treatment of acute rheumatic fever for the prevention of rheumatic heart disease, in this study was generally good. Majority (71.5%) of the study participants were aware of the importance of follow-up after initial treatment of rheumatic fever for the prevention of rheumatic heart disease. Majority (79.7%) of females and males (63%) were aware. The highest proportion (91.2%) of subject awareness was found among those aged 50 years old and above, followed by those aged 9 to 19 years old (77.3%). Those who had post secondary level of education comprised the highest proportion (83.9%) of awareness among all levels of education, therefore advanced age and higher level of formal education was associated with high proportion of subject awareness on importance of regular follow-up after initial treatment of acute rheumatic fever. The findings of this study were almost similar to that of a study done by Rauf-ur Rashid Kaul et al: to determine the prevalence of rheumatic heart disease in school children (5-15 years) in



rural block Srinagar. In that study proportion of regular follow-up was found to be 64.3% which was almost similar to current study (71.5%). The higher percentage found in current study may be due to the age difference in the two study populations. The previous study had recruited only children. Current study results were also similar to study done by S. S. Danbauchi, et al²³: in Zaria, Northern Nigeria, In that study the proportion of awareness on importance regular follow-up was found to be 68% which was almost similar to current study findings.

The proportion of awareness of minimum recommended duration of monthly injection for the prevention of rheumatic heart disease in this study was (25.1%), Over seventy percent 74.9% of the study population were not aware of minimum recommended duration for regular monthly injection for rheumatic heart disease prevention. There were no much difference in subject awareness among males and females, those who were aged 9 to 19 years comprised the highest percentage (40.8%) of subject awareness among all age groups. Those who had primary level of education constituted the highest proportion of awareness among all levels of education. These findings can be explained by the fact that children and adolescent were most likely to be on regular monthly injection hence more aware compared to other age groups. Another study by Sadiq MI et al¹⁹, determining the prevalence of RHD among school children aged 5-15 years from 70 schools, in urban and semi urban areas of Lahore, Pakistan. Proportion of awareness was found to be less than 20% which was lower than current study (25.1%) the difference in proportion was attributed to different study population. In that study the author recruited children (mean age was 10.7 years) while in current study both children and adults were recruited. In a study done by Mohamed et al, the aim of the study was to provide a detailed description of the clinical profiles of rheumatic fever and rheumatic heart disease in Egypt. The author found that the majority of those who had rheumatic fever were not on regular monthly injection for RHD prevention due to lack of awareness, the findings were similar to current study result. Another study by Oli K, et al¹⁷ to assess the status of RHD prophylaxis among rheumatic heart disease patients, only 22% of those who had RF/RHD were on regular medication these results were also similar to current study findings.



4.1.2.3. Awareness of rheumatic fever and rheumatic heart disease prevention among primary health care workers:

The proportion subject awareness on rheumatic fever and rheumatic heart disease prevention among primary health care workers was generally good in all aspect of primary and secondary prevention of rheumatic heart disease. The proportion of subject awareness on cause of sore throat was found to be 60.6%. Lack of awareness in nearly 40% of primary health care workers is worrisome hence more focus on training for all primary health care workers is needed to update their knowledge on causes of acute severe form of sore . Majority of those who were aware were clinicians their proportion of awareness ranging from 63% to 74%. Males subjects had higher proportion of awareness on causes sore throat, older health care workers (50 +) had higher proportion of awareness on causes of sore throat. Therefore high level of formal education, advanced age and higher cadres of profession were associated with high proportion of awareness on causes of sore throat among primary health care workers. This study finding were almost similar to a study done by Sadiq MI et al¹⁹

The proportion of subject awareness on appropriate treatment of sore throat was found to be 94.8%, association between sore throat and rheumatic fever (73.1%), regular follow-up (81.3%), clinical presentation of rheumatic fever (62.2%) and recommended duration for monthly injection (67.8%) this findings suggest that low proportion of awareness among non health care workers (community) was not attributed by ignorance of primary health care workers rather was due to poor health seeking behavior of the community.

These finding were almost the same to other studies by S. Chadha, et al²⁰, where all clinicians treated all patients with appropriate antibiotics. Another study with similar results to current study was by S. S. Danbauchi, et al²³: where knowledge on clinical presentation of rheumatic fever among physicians was 76%, which was slightly higher than current study (62.2%) the difference may be due to difference in level of knowledge among the study populations. The current study recruited only clinician at primary health care level while the previous study participants were physicians' hence higher proportion of subject awareness on rheumatic fever/rheumatic heart disease.



CHAPTER FIVE

5.1. CONCLUSIONS AND RECOMENDATIONS

5.1.1. Conclusion

A: For non health care workers (community)

1. The proportion of awareness of rheumatic heart disease prevention among non health care workers (community) was found to be low in all aspects of primary prevention.
2. High level of formal education was associated with higher proportion of awareness in some aspects of RHD prevention, like causes of sore throat, and appropriate drug usage for treatment of sore throat
3. Primary level of education was associated with higher proportion of awareness on association between sore throat and rheumatic fever and minimum recommended duration of monthly injection for rheumatic fever/rheumatic heart disease prevention.
4. Majority of non health care workers (community) were not aware of minimum recommended duration of regular monthly injection for the prevention of rheumatic fever /rheumatic heart disease.

B: For Primary health care workers

5. The proportions of awareness of rheumatic fever and rheumatic heart disease prevention among primary health workers were generally high in all aspects of primary and secondary prevention.
6. Higher level of formal education was associated with higher proportion of awareness in most aspects of primary and secondary prevention of rheumatic fever and rheumatic heart disease.
7. Higher cadre of profession was associated with higher proportion of awareness on association between sore throat and rheumatic fever, clinical presentation, adequate and appropriate treatment of acute sore throat.



5.1.2. Recommendations

4. Raise public awareness on rheumatic fever and rheumatic heart disease through the print and electronic mass media (radio, television, newsletters, and posters) and involve community leaders, nongovernmental organizations and community health educators, emphasis should be on:
 - a. Importance of adequate treatment of GAS pharyngitis, especially in pre-school and school children by using recommended drugs.
 - b. Association between sore throat and RF
 - c. Clinical presentation of acute rheumatic fever
 - d. Recommended duration of RF/RHD prophylaxis

5. Kinondoni municipality should plan for municipal campaign emphasis on raising awareness on all aspects of RF/RHD prevention as it is in HIV/AIDS control

6. Establish municipal training courses/seminars for medical and paramedical workers in kinondoni municipality on integrating prevention and treatment of rheumatic fever and rheumatic heart disease into primary health care facilities.

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14. Monthly intramuscular injection is recommended for at least 5 years post infection for prevention of valvular heart disease (true or false)

B. Questionnaire for health workers

1. Questionnaire no:
2. Age
3. Gender.....
4. Level of education
 - a. Primary school
 - b. Secondary school
 - c. Post secondary school
5. Occupation
 - i. AMO
 - ii. CO
 - iii. CA
 - iv. NO
 - v. NMW
 - vi. PHN
 - vii. MA
6. How do you treat a patient with acute sore throat.....
7. What organisms cause severe form of acute sore throat.....
8. Is sore throat associated with acute rheumatic fever?(yes or no)
9. The following are signs of acute sore throat due to bacterial infection (true or false)
 - A. Sore throat (generally of sudden onset)
 - B.Pain on swallowing
 - C.Fever of varying degree (usually from 101°F to 104°F)
 - D.Tonsillopharyngeal erythema with or without exudates
 - E.Anterior cervical lymphadenitis



10. Mention antibiotic recommended for the treatment of bacterial sore throat
.....
11. Adequate treatment of acute sore throat is important for the prevention of acute rheumatic fever(true or false)
12. The following are signs and symptoms of acute rheumatic fever(True or false)
 - A .Carditis
 - B. Migratory painful joints
 - C. Abrupt purposeless movements with or without emotional changes
 - D. Nonpruritic rash occurs on the trunk and limbs sparing the face.
 - E. Small painless, round multiple nodules on the bone prominence
13. After initial treatment of acute rheumatic fever it is important to follow the patient for prevention of rheumatic heart disease (true or false)
14. Mention the drug recommended for prevention of rheumatic heart disease
.....
15. Mention single most important drug you give to your patient during follow up for prevention of rheumatic heart disease.....
16. Five years follow-up is the minimum period recommended depending on age of disease onset (true or false)



Appendix II. Swahili version questionnaire

Dodoso kwa wasiowafanyakazi wa Afya

1. Namba ya dodoso.....
2. Umri.....
3. Jinsia.....
4. Kiwango cha elimu.....
5. Kazi
6. Umewahi kuumwa na koo siku za nyuma ?(ndiyo au hapana)
7. Kama ndiyo ulifanya nini iliupone? Andika ulichofanya.....
8. Unadhani ugonjwa wa koo unasabishwa na kitu gain taja kimoja.....
9. Je kunauhusiano wowote kati ya ugonjwa wa koo na ugonjwa wa moyo?(ndiyo au hapana)
10. Matibabu ya ugonjwa wa koo ni muhimu sana ilikuzuia ugonjwa wa moyo(kweli au sikweli)
11. Zifuatazo ni dalili za ugonjwa wa moyo (andika kweli au sikweli kwenye nafasi wazi)
 - A. Kuumwa moyo
 - B. Viungo mbalimbali vya mwili kuuma na kuvimba
 - C. Mkono au mguu kuchezecheza bila kuchezesha,kunakoanza ghafla bila mpangilio na hiari
 - D. Vipele kwenye ngozi ambavyo haviwashi wala haviumi
 - E. Vinundunundu vingi chini ya ngozi vinavyotokea sehemu za mifupa kama vile kwenye kiwiko
12. Baada ya matibabu ya ugonjwa wa moyo ya awali kuendelea kwenda kliniki ni muhimu sana ilikuzuia ugonjwa wa valvu za moyo(kweli au sikweli)
13. Sindano moja kila mwezi huchomwa ilikuzuia ugonjwa wa valvu za moyo hufanyika kwa muda usiopungua miaka mitano.(kweli au sikweli)

Swahili version for medical workers

1. Namba ya dodoso.....
2. Umri.....
3. Jinsia.....



4. Kiwango cha elimu.....
5. Kazi.....
6. Unatumia dawa gani kutibu ugonjwa wa koo? Itaje
7. Je ugonjwa woa koo una uhusiano wowote na ugonjwa wa moyo(ndiyo au hapana)
8. Matibabu sahihi ya ugonjwa wa koo ni muhimu sana ilikuzuia ugonjwa wa moyo(kweli au sikweli)
9. Zifuatazo ni dalili za ugonjwa wa koo unaosababishwa na bacteria
 - A. madonda kooni yaanzayo ghafla
 - B. maumivu wakati wakumeza chakula hata mate
 - C. homa kali (101°F - 104°F)
 - D. kuvimba tonsili,nyekundu na wakati mwingine huweka usaha juu yake
 - E. kuvimba tenzi za mbale shingoni
10. Taja dawa abayo shirika la afya ulimweni linashauri itumike kutibu ugonjwa wa koo
11. Matibabu sahihi ya ugonjwa wa koo ni muhimu sana ilikuzuia ugonjwa wa moyo (kweli au sikweli)
12. Zifuatazo ni dalili za ugonjwa wa moyo (andika kweli au sikweli kwenye nafasi wazi)
 - a. Kuumwa moyo
 - b. Viungo mbalimbali vya mwili kuuma na kuvimba
 - c. Mkono au mguu kuchezecheza bila kuchezesha,kunakoanza ghafla bila mpangilio na hiari
 - d. Vipele kwenye ngozi ambavyo haviwashi wala haviumi
 - e. Vinundunundu vingi chini ya ngozi vinavyotokea sehemu za mifupa kama vile kwenye kiwiko
13. Baada matibabu ya moyo ya awali nimuhumu sana kuendelea kumfuatilia mgonjwa ilikuzuia ugonjwa wa valvu za moyo(kweli au sikweli)
14. Taja dawa iliyopendekezwa na shirika la afya ulimwenguni ya kuzuia ugonjwa wa valvu za moyo kwa wagonjwa wa moyo.....



15. Taja dawa moja muhimu ambayo unawapatia wagonjwa wa moyo unapowafuatilia ilikuzuia ugonjwa wa valvu za moyo.....
16. Shirika la afya duniani limependekeza kumfuatilia mgonjwa kwa muda usiopungua miaka mitano kutegemeana na umri ugonjwa ulipogundulika (kweli au sikweli)



Appendix III: Consent form

Consent to participate in the study assessing the level of awareness of Rheumatic Heart disease in Kinondoni municipality, Dar –es- salaam

Dear Sir/Madam,

Greetings!

My Name is Dr. Maria Manase .I am a Resident Doctor in The Department of Internal Medicine at MUHAS. I am conducting a study regarding the level of awareness of Rheumatic heart Disease in among primary health care providers working at dispensaries or health centres, and people aged 9 years and above, in Kinondoni municipality . I am requesting your participation.

Purpose of the study:

The aim of this study is to determine the level of awareness of prevention of rheumatic heart disease among primary health providers working at dispensaries or health centres, and people aged 9 years and above in Kinondoni municipality.

How to participate:

Patients who will be ready to participate will sign a consent form to approve his/her willingness.

Interview will then be done by using self administered structured questionnaire. Those who cannot read or write will be assisted by researcher.

Confidentiality:

Information obtained from you will be confidential and will be of help in study and may be used for future plans in prevention of rheumatic heart disease in Tanzania.

Costs:

The costs for investigations will be covered from my sponsorship funds by the Ministry of health.

Voluntary participation & rights to withdraw:

Your participation is voluntary and you have the right to withdraw from participating in my study at any time. Whatever your decision may be, it will not affect in any way your *rights to care and treatment.*

Risks

There's no risk in participating in this study.



Benefits:

Your participation in this study will help you know about your state of health. Not only shall you get rheumatic heart disease education, but the principal investigator will also, communicate with the health personnel for treatment when needed. Furthermore, you will get medical advice anytime during the study period by directly communicating with the doctor involved in this research.

We hope that the information from this research will be useful in contributing to improve the plans for prevention of rheumatic heart disease.

Contact persons:

If you have any inquiries about this study, please do not hesitate to contact:

Dr. MARIA MANASE
Principal Investigator
Muhimbili University of Health and Allied Sciences (MUHAS)
Department of Internal Medicine
P.O. Box 65001 Dar es Salaam. Tel. 0713599763

OR in case of any information about your rights as a participant in this study please contact: The Director Research and Publication committee
Muhimbili University of Health and Allied Sciences (MUHAS)
P.O. Box 65001 Dar es Salaam
Tel. 2151489

I will be grateful if you willingly agree to participate in this study.

I _____

Have understood the above information and my questions have been answered by the investigator to my satisfaction. I willingly agree to take part in this research.

Name of the participant: _____

Signature of the participant: _____

Name of the Witness _____

Signature of the Witness: _____ Date

(Witness): _____

Date of signed consent: _____



APPENDIX IV: Consent form - swahili version

fomu ya makubaliano ya kushiriki katika utafiti

Habari! Mimi ni Dk Maria Manase ni Daktari katika shahada ya Uzamili katika Chuo Kikuu Cha Sayansi Za Tiba cha Muhimbili. Nafanya utafiti kuhusu kiwango chaufahamu wa ugonjwa wa moyo, jinsi ya kuzuia ugonjwa wa moyo kwa watoa huduma wa afya katika zahanati au vituo vya afya pamoja na watu wenye miaka tisa au zaidi wanaoishi manispaa ya Kinondoni, dar es salaam.

Nia ya Utafiti:

Dhumuni ni kujua kwa kiwango cha ufahamu wa jinsi ya kuzuia ugonjwa wa moyo kwa watu wnye umri wa miaka tisa au zaidi, pamoja na watoa huduma ya afya katika zahanati au vituo vya afya katika manispaa ya Kinondoni.

Jinsi ya Kushiriki:

Mtu ambaye yuko tayari kushiriki ataweka sahihi yake, ili kuonyesha utayari. Yatafuata maswali machache ya Utangulizi, kisha washiriki watapewa dodoso za kujaza, kwa wale wasiojua kusoma na kuandika atasaidiwa

Usiri:

Taarifa ya magonjwa yako hazitatangazwa kwa yoyote zaidi ya mtafiti. Matokeo ya utafiti kwa ujumla yatasaidia kuboresha mipango itakayotumika kuzuia ugonjwa wa moyo

Utafiri wakushiriki au kujitoa:

Kushiriki kwako ni hiyari na waweza kujitoa. Lakini haitakunyima haki ya kupata tiba zingine.

Faida:

Kushiriki kwako katika utafiti huu, kutakusaidia kujua afya yako. Pia utapata elimu, na ushauri kuhusu ugonjwa wa moyo na matibabu yake pamoja na njia za kuzuia ugonjwa wa moyo.

Tunatarajia taarifa zitokanayo na utafiti huu, zitasaidia kuboresha huduma za afya kwa wagonjwa wa moyo

Nitakushukuru kushiriki kwako utafiti huu. Aksante.

Iwapo utakuwa na swali lolote kuhusu utafiti huu wasiliana na:

**Dr Maria Manase**

Mtafiti Mkuu;

Chuo Kikuu Cha Afya Na Sayansi za Tiba Muhimbili; Idara ya Tiba; S.L.P 65001 Dar Es Salaam. Simu 0713599763

AU endapo utakuwa na swali lolote kuhusu haki zako kama mshiriki katika utafiti huu wasiliana na:

Mkurugenzi wa kamati ya tafiti na matoleo chuoni.

Chuo Kikuu Cha Afya na Sayansi za Tiba Muhimbili;

S.L.P 65001 Dar Es Salaam; S.L.P 65001

Dar Es Salaam .

Simu 2151489.

Mimi.....nimeelezwa/ nimesoma yaliyomo katika fomu hii na nimeelewa maana yake. Nakubali kushiriki katika utafiti huu.

Sahihi.....(Mshiriki) Tarehe.....

Sahihi..... (Mtafiti) Tarehe.....