Early Malaria Diagnosis and Treatment Seeking Behaviour among Clients Attending Outpatient Department Sekou-Toure Regional Referral Hospital in Mwanza, Tanzania: A Cross-Sectional Study

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ABSTRACT

Background: Early diagnosis of malaria and treatment seeking behaviour play key role in controlling and preventing further complication related to malaria disease. Aim of this study was to determine the responses on early malaria diagnosis and treatment seeking behaviour among outpatient clients attending at Sekou toure regional referral hospital in Mwanza, Tanzania.

Methods: A cross-sectional study was conducted among outpatient client at Sekou-Touré regional referral hospital, convenient simple random sampling used and self-administered questionnaire were used to collect data and data was entered into Microsoft excel and then exported to SPSS version 25.0 for further analysis and presented on the percentages and table. The analysis of strength of relationships between categorical variables was conducted using the Chi-square test. A p-value of ≤ 0.05 was considered to be statistically significant.

Results: A total of 192 respondents completed the study with a response rate of 97.6%. The study revealed that Most of the respondents about 90.6% stated they would seek treatment from health fa-

cility when symptoms appear. However, only 6.3% seek treatment within 24 hours of onset of illness (p=0.017). Half of respondents (50.5%) experienced malaria symptoms in the past six months and only 30% seek for treatment at health facility. Preference of health facility, (51%) respondents were going direct to pharmacy to buy medicine for self-treatment. Overall, cost of service, time consumed and distance of health facility especially health center shows significant with such delay.

Conclusion: A low proportion of malaria-suspected patients sought treatment within 24 h of fever onset compared to the national target. Distance from the health facility, cost of service and time consumed were found to be predictors of early treatment-seeking behaviour for malaria. Strengthening strategies tailored to increasing awareness for communities about malaria, importance of going hospital and early treatment-seeking behaviour is essential.

Keywords: Early diagnosis, Behaviour, Illness, Malaria, Treatment-seeking

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INTRODUCTION

Malaria in Tanzania is still a challenge that affects general welfare of people and is a leading cause of morbidity and mortality and most affected are the pregnant women and the children under 5 years. There are control tools recommended for early detection is quality-assured diagnostic like Malaria Rapid Diagnostic Tests (MRDT) and treatment of malaria cases with Artemisinin-based Combination Therapy (ACT), which helps in assurance early detection and also in medical management of malaria.

World Health Organization in Geneva 2013, show that early treatment seeking is helpful in ruling out the disease and help in preventing and controlling malaria through prompt recognition of symptoms and signs of malaria from household level to community level (D'Acremont V and Bosman A, 2013). Early treatment also requires that appropriate health services and medication are accessible and used (D'Acremont V and Bosman A, 2013).

Treatment seeking behaviour for malaria need to be undertaken to identify patterns of care seeking and to assess what is known about the adequacy of the treatments used. Study done in Ethiopia it shows that early diagnosis and treatment of malaria should take place within 24 hours of the onset of symptoms (Regassa H, *et al.*, 2018).

Healthcare seeking behaviour vary among those who utilize health facilities like hospitals, dispensaries and those who self-purchase

of drugs exclusively on self-treatment usually with antimalarial were 58% to 42% respectively (Regassa H, *et al.*, 2018; Sumari D, *et al.*, 2016) According to study done in Oromia Ethiopia show that among those participants who were seeking treatment to health facilities seem to delays averaging three or more days (Regassa H, *et al.*, 2018).

Knowledge on Early diagnosis and effective treatment seeking of malaria is an essential component to reduce the burden of malaria. This requires appropriate infrastructure and resource, and also active engagement and participation of communities (Yadav SP, 2010; Yadav SP, *et al.*, 2013). The response to most episodes begins with self-treatment, and close to half of case rely exclusively on self-treatment, usually with antimalarials and the study show the exclusive reliance on traditional methods is extremely rare, although traditional remedies are often combined with modern medicines (Battle KE, *et al.*, 2016; Okonofua FE, *et al.*, 1992).

According to study done in Zambia 2010, show that the early diagnosis of the disease and treatment may be affected by several parameters including percentage of pregnant women receiving prenatal care, education level, government health expenditure, and GDP growth (McCombie SC, 1996). Treatment-seeking rates, which varied both within and among regions, revealed that public facilities were not always the primary facility type used (McCombie SC, 1996). mcCombie SC Shows that 80.8% of the respondents reported that going to the hospital was their immediate care-seek-

ing behaviour once they felt malaria symptoms, while 11.2% opted for self-medication (Regassa H, *et al.*, 2018).

The availability of ACT in all health facilities (government and private health facilities) and diagnostic material (microscopes or MRDT) is important for early diagnosis and proper treatment for the sick person to avoid malaria resurgence and effective surveillance system for breaking transmission. Also it is important to define the nature of self-treatment, record of multiple treatments and attempt to identify the proportions of all cases that begin treatment with antimalarial as standardized time intervals (Regassa H, *et al.*, 2018).

Early diagnosis and early treatment malaria play roles in reducing disease cases and to prevent death, according to WHO treatment guideline the best treatment recommended is Artemisinin-based Combination Therapy (ACT), diagnostic test need to be taken before administering drugs so as to avoid drug resistance and availability of diagnostic tools in all health facilities is very important.

Study done in Ethiopia showed that there was lack of knowledge toward treatment seeking behaviour and early diagnosis showed that majority had poor knowledge which lead to low level of health-seeking behaviour (Mitiku I and Assefa A, 2017; Asfaw LS, *et al.*, 2018). In spite of having Malaria control programs in Tanzania, still there is an increasing number of malaria cases, this situation may be influenced by the people who do not attend to the health facility for diagnosis, adherence of treatment regime and some fail to find medical care when they feel sick, inadequate of diagnostic tools and proper treatment or community does not accept ACT (Mitiku I and Assefa A, 2017).

There is no current study done regarding the knowledge on early diagnosis of malaria and treatment seeking behaviour in Mwanza region, henceforth, this study therefore aims to determine the knowledge on early Malaria diagnosis and treatment seeking behaviour among clients attending Outpatient department at Sekou-toure Regional referral hospital in Mwanza, Tanzania.

METHODS

Study setting

This study was conducted in patients who attend outpatient department at Sekou Toure Regional Referral Hospital, which is among the hospital located in Mwanza Region. Mwanza region is among of the six lake zone regions in Tanzania. Sekou Toure Regional Referral hospital serving a population of about 2,773 million. The hospital has 315 beds capacity and this hospital has RCH clinic. These hospitals have various clinical specialties such as General internal medicine, General surgery, Gynaecology and Obstetrics, Pediatrics and Child health, Orthopaedics, Laparoscopic Surgery, Cardiology and Infectious Disease.

Study design

The cross-sectional hospital-based study was conducted in outpatient client aged 18 years and above attending at Sekou Toure Regional Referral hospital.

Study population

The study was including all outpatient clients aged 18 years and above attending at Sekou Toure Regional Referral hospital.

Selection criteria

All outpatient clients aged 18 and above attending at Sekou-Toure Regional Referral hospital during study time and who was willing to participate on the study after consent were included in the study and exclusion involved all outpatient clients aged 18 years and above attending at Sekou Toure regional referral hospital who was refuse to participate and all outpatient clients who was aged below 18 years during study time.

Study sample size and sampling procedure

The minimum sample size of study participant was obtained by using Kish-Leslie formula (Kish L, 1965) whereas the total sample size of 192 participants was recruited in the study. Simple random sampling was used where by every outpatient client attending at Sekou Toure regional referral hospital have an equal chance to be selected.

Data collection and tools

Data were collected through structured self-administered questionnaire prepared in English and Swahili language, which was involving all outpatient clients attending at Sekou-toure hospital who were willing and give consent to participate during study.

Data analysis procedure and statistical analysis

The data analysis planned to include descriptive and inferential statistics; data was entered into Microsoft excel and then exported to Statistical Package for Social Sciences software (SPSS version 25.0) for further analysis and presented on the percentages and table. The analysis of strength of relationships between categorical variables was conducted using the Chi-square test. A p-value of <0.05 was considered to be statistically significant.

RESULTS

Socio-demographic characteristics

A total of 192 respondents were interviewed and included in the analysis, after removing forms with major errors and those which were grossly incomplete making the response rate 97.6%. Most of the respondents were male (63.2%), about (60.4%) married and about 149(77.6%) were residing in urban area. The median age was 28 years (IQR 20:35) and 63.5% were in the age group 24-35 years. Also, 159 (82.8%) were Christian. In terms of educational background, about (12.5%) respondents were not able to read and write (no formal education) and about 52.1% majority of respondents were having primary education level. Also, about (46.9%) of respondents were unemployed (*Table 1*).

Table 1: Sociodemographic characteristics

Category	Frequency	Percent%
Gender		
Male	121	63
Female	71	37
Age(years)		
18-24	19	10
25-34	122	63.5
35-44	30	15.4
45 and above	21	11
Religion		
Christian	159	82.8
Islamic	28	14.6
Pagan	5	2.6
Marital status		
Single	58	31.4
Married	116	60.4

Divorced	2	1
Widow	12	6
Separated	4	2
Education level		
University/College	26	13.5
Secondary	42	21.9
Primary	100	52.1
Informal	24	12.5
Family size		
Below 5 people	110	57.3
5 people and above	82	42.7
Residence		
Urban	149	77.6
Rural	43	22.4
Occupation		
Private services	16	8.3
Agriculture	55	28.6
Government worker	20	10.4
Business	11	5.8
Unemployed	90	46.9

Knowledge of early symptoms of malaria and measure taken after the onset of illness among study population

The study respondents about (64.6%) they had awareness on symptoms of malaria and (35.4%) they were not aware on symptoms of malaria. Respondents reported that significant malaria symptoms included fever (90%), headaches (72.6%), chills/rigor (41.1%), vomiting (50%), Joint pain (48.4%), lack of appetite (56.5%) and general body weakness (56.5%). However, significant differences were noted for fever and headaches p<0.05. The majority (87%) of respondents said that antimalarial drugs were the appropriate medicine for treat malaria and it should be given immediately (*Table 2*).

Table 2: Symptoms of malaria as perceived by study population

Symptoms[a]	Frequency (n=192)	Percent (%)
Fever	104	90
Headache	90	72.6
Nausea/Vomiting	62	50
Chill/ Rigour	51	41.1
Joint pain	60	48.4
Loss of appetite	70	56.5
Body weakness	70	56.5
I don't know	69	35.9

Note: [a]Symptoms with multiple responses

Measures taken after the onset of malaria illness

Response to those who were having symptoms during study period up to last 6 months, about 97 (50.5%) respondents, only (30%) were seeking for treatment at health facility and majority 70% self-medicate after buying drugs at pharmacy (p<0.05). Basing on the knowledge about diseases which have the same symptoms as of malaria, only 55(28.6%) respondents were aware of those conditions compared to 137(71.4%) of respondents who were not aware of those diseases. Among those who were aware of some disease which have same symptoms as of malaria, (80%) mentioned Urinary Tract Infection (UTI), Dengue and Typhoid and others 64% they term fever as the disease (*Table 3*).

Table 3: Action taken after the onset of illness and knowledge of disease which have same symptoms as of Malaria

Measures taken after onset of illness	Frequency	Percent%
Going to health facility	57	30
Self-medication	135	70
If yes, which diseases have same symptoms as of malaria?		
Urinary Tract Infection (UTI)	34	61.8
Typhoid	28	51
Fever	40	64

Treatment seeking duration after onset of illness

In the bivariate analysis, among the socio-demographic characteristics of respondents, age, residence, ethnicity, occupation and religion were significantly associated with malaria treatment-seeking behaviour. Of the malaria perception variables, perceived susceptibility for malaria, perceived barriers to treatment-seeking and cues to action (p<0.05) were found to affect the treatment-seeking behaviour of the people.

Among 192 respondents who seek treatment after onset of illness, about 12(6.3%) had seek for treatment within 24 hours of onset of illness (p=0.017), 84(43.7%) were seeking for treatment 2-3 days after onset of illness, 96(50%) decided to seek for treatment when the condition become severe. As shown in (*Table 4*), seeking treatment within 24 hours of illness onset was not common among people with high literacy rate compared to those with no formal education.

**Table 4: Treatment seeking duration after onset of illness**

Variable	Frequency	Percent%	p-value
Within 24 hours after feeling the symptoms	12	6.3	<0.04
After 2-3 days of symptoms	84	43.7	<0.05
After condition become severe	96	50	0.0734

Treatment seeking behaviour after onset of malaria illness

Toward measures taken after the onset of illness (Table 5), about (98.4%) they respond positive that they tend to seek for treatment and regarding where they tend to seek for treatment, about 114(59.4%) tend to go to health facility, 10(5.2%) tend to seek spiritual leaders, 1(0.52%)tend to seek traditional healer for treatment, 31(16.1%) were using traditional medicine and homemade remedy, and 20(10.4%) they tend to go to spiritual leaders, using homemade remedy and going to health facility if condition become chronic (*Figure 1*).

Table 5: Treatment seeking behavior and treatment facility of choices among study population after onset of illness

Variable	Frequency	Percent%	p-value
Prompt seeking treatment after onset of illness			
Health facility	114	59.4	<0.05
Seek spiritual leaders	10	5.2	0.546
Seek traditional healer	1	0.52	0.78
Using traditional medicine and home-made remedy	31	16.1	0.233
All of the above	20	10.4	0.093
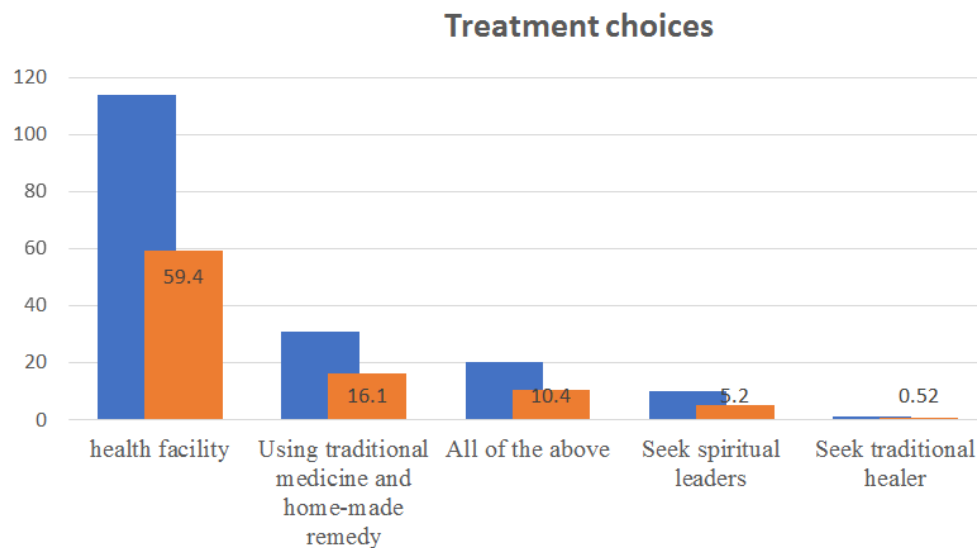
Figure 1: Bar chart showing the facility of choices of where they seek for treatment after the onset of illness. Note: Blue: Frequency; Orange: Percent%

Treatment seeking rate at health facilities after the onset of malaria illness

The findings of this study show the first health facility of choice when they seek for treatments. Whereby, about 98(51%) respondents preferred to seek treatment at nearby pharmacy (drug shops) to buy medicine for self-treatment. Number of people who seek for treatment at pharmacy and local drug shops were higher compared to those who seeking for treatments in other health facilities. Overall, about 41(21.4%) respondents preferred to go first at laboratory nearly home and only 51(26.6%) respondents were seeking treatment to nearly health center. Overall, cost of service, time consumed and distance of health facility especially health center shows correlation with delayed in treatment seeking (p<0.05) (*Figure 2*).

Treatment regime for malaria illness

Study showed different type of medicine they use for treatment after being discovered to have malaria parasite, study finding show statistically significant as majority about 166(86.5%) were using Artemisinin based combination/Artemether-Lumefantrine (ACT/ALU) which is the recommended regime for malaria treatment by WHO, whereby among those who utilizing ACT only (65.6%) respondents believe that this combina-

tion is effective in malaria treatment and other's believed that ACT's were not effective for treatment of malaria, whereby some commend that the drug it not effective as disease tend to relapse and others says the drugs tend to increase the magnitude of disease that's why they were using with other herbal medicine for effective treatment and about 3(1.6%) they don't know the type of medicine they were using for treatment (*Figure 3*).

On extent of utilizing the prescribed antimalarial drug for treatment, about 98(51%) respondents were adhering on antimalarial drugs till they finish dose, 82(42.7%) respondents were stop using medication after feeling a relief of being healed and 12(6.3%) respondents were stop using antimalarial when they feel tired of taking medication (*Figure 4*).

Factors affecting early treatment seeking behaviour within study population

Findings of this study show revealed that, people they tend to delay to seek treatment early after the onset of illness due to several circumstances whereby about 51% of respondents long distance from their area of residence to health facility act as a hindrance for them to seek treatment earlier, also the cost of health care services, time consumed in health facility especial at hospital and other self-treated without going to hospital (*Figure 5*).
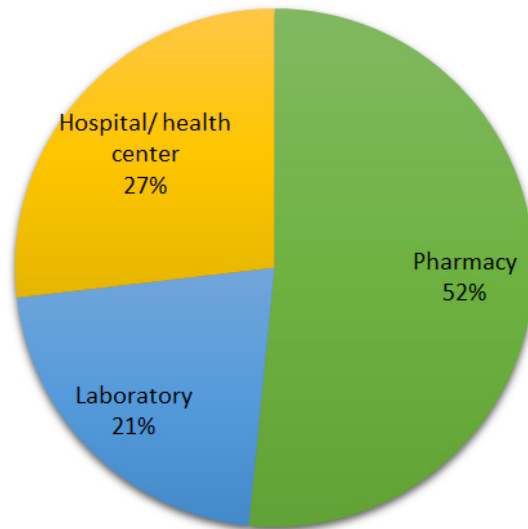
Figure 2: Population treatment seeking rate at health facilities after the onset of malaria illness. Note: Green: Pharmacy; Blue: Laboratory; Yellow: Hospital/Health center
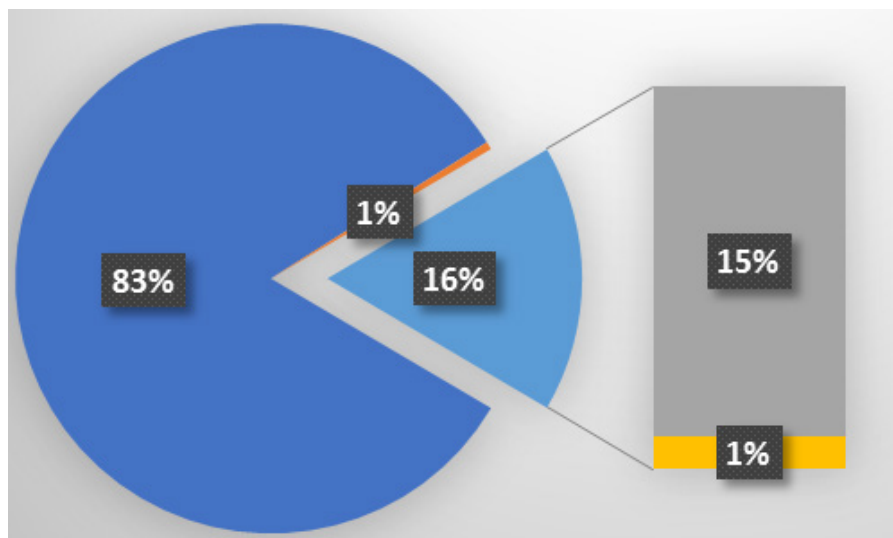

Figure 3: Type of medication used for treatment given after discovering malaria parasite. Note: Blue: Artemisinin based combination/ Artemether-Lumefantrine (ACT/ALU); Orange: Herbal medicine; Grey: Mixture of ACT and herbal medicine; Yellow: Unknown
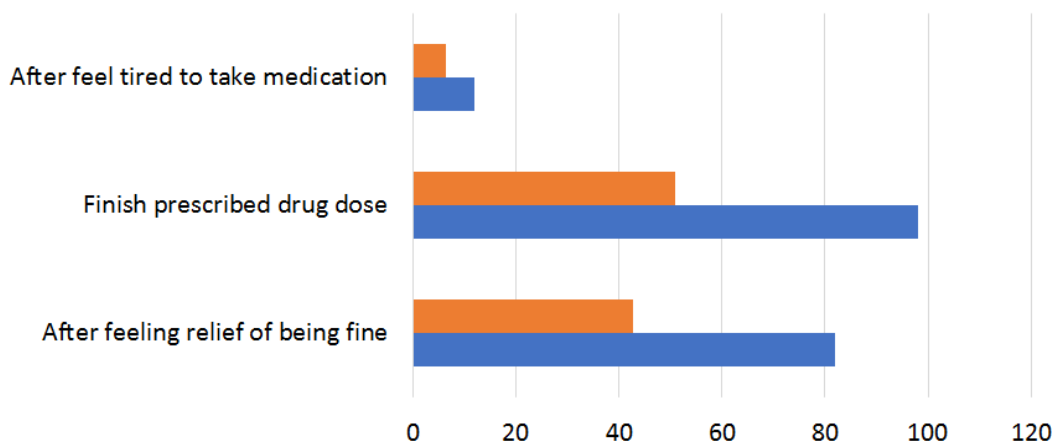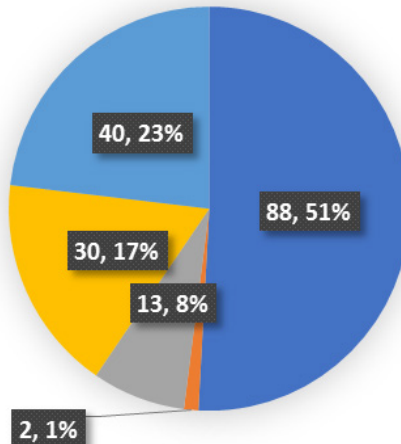

Figure 4: Adherence of antimalarial drug for treatment. Note: Blue: Frequency; Orange: Percent

Figure 5: Causes of delay for early treatment-seeking after onset of illness. Note: Blue: Long distance from Health facility; Orange: Unsatisfactory Health services; Grey: Self-treatment without going to hospital; Yellow: Lack of trust on effectiveness of Malaria Rapid Diagnostic Tests (MRDT)

DISCUSSION

This cross-sectional study was conducted to determine the community behaviour towards early diagnosis and early treatment seeking after the onset of malaria disease. The finding of this study revealed that education level, level of income, knowledge toward malaria, environmental factors such as accessibility, affordability and availability of services, maleness and desirable facility for treatment were the common factors that contributing in delay to seek treatment after the onset of illness. Whereby, level of knowledge toward malaria illness was high about 65% but the response toward prompt treatment seeking was very low, whereby about 93.7% delay to seek treatment within 24 hours after onset of illness and they took 2-3 days and some go to health facility when condition become severe. This seems similar to study done in Kenya and Myanmar (Sumba PO, *et al.*, 2008; Naing PA, *et al.*, 2017).

Moreover, finding of this study shows that educational level and knowledge on symptoms of malaria (P<0.05) were found having significant association with early treatment seeking behaviour. Although the knowledge was adequate, 65% have knowledge but the practice of early treatment seeking behaviour of malaria was low. This also could be due to community's inability to distinguish malaria's symptoms with other similar diseases and other febrile illness in the first two days of onset of the illness. Similar findings were reported in Ethiopia, Eritrea and Myanmar (Andegiorgish AK, *et al.*, 2019; Dida N, *et al.*, 2015; Xu JW, *et al.*, 2012).

The health facility where people prefer to seek for treatments after the onset of illness, study show that majority of people they tend to seek treatment earlier at pharmacy (drug shop) to buy medicine for self-treatment than other places like hospital or health center and laboratory (Xu JW, *et al.*, 2012). The number of people who seek for treatment at pharmacy and local drug shops were higher compared to those who seeking for treatments in other health facilities. These reveal the peoples knowledge on importance of going at health center or hospital for early diagnosis and treatment is very low, the cost of services at hospital including hospital registration fee and other chargers is higher where majority of people they prefer to go to pharmacy where the cost of service and drug is affordable and not time consuming, Also distance to nearby hospital/health center seem as hindrance in early treatment-seeking and hence lead to delayal. Compared to study done in Ethiopia (Workineh B and Mekonnen FA, 2018).

Gender effect on treatment seeking behaviour, study shows that most of male sought to delay in treatment seeking than female. This rate is higher compared to other study done in Canada, which showed both male and female were equally seeking for healthcare early (Thompson AE, *et al.*,

2016).

Our study findings show that, those who residing in rural areas were found to seek health care more than those who residing in urban. This study finding may be explained by the fact that those who residing in urban are relatively more educated, with better access to pharmacies and drug shops and thus the tendency to self-treat, as about Studies have reported that perceived efficacy is related with tendency for self-treatment of malaria and there is no study relating to these findings.

Self-treatment was common; most of respondents did not seek appropriate care within 24 hours after onset of clinical symptoms. A delay of more than 24 hours in care seeking has also been reported in other studies (Mitiku I and Assefa A, 2017). The study reports shows that among those with undifferentiated fever, less than one-third get their blood tests done for malaria despite the fact that most of them seek care (Naing PA, *et al.*, 2017).

Findings of this study reveal high cost of services and long distances to health facilities were the challenges affecting treatment seeking behaviour as many they sought to delay at health facility for some days, whereby 73% they did not prefer to go at health facility till the condition seems persisted. Compared to studies done Eritrea showed that cost is often a barrier to seeking health services especially among the poor (Andegiorgish AK, *et al.*, 2019).

LIMITATION OF THE STUDY

Inadequate fund to carry out this study, Language barrier as most of people they speak in Sukuma language, the study requires a larger number of participants hence was consumed time in data collection and analysis.

CONCLUSION AND RECOMMENDATIONS

Therefore, findings of this study indicate that a health education strategy stressing the importance of prompt seeking-treatment within 24 hours of onset of symptoms. A low proportion of malaria-suspected patients sought treatment within 24 hours of fever onset compared to the national target. Distance from the health centres, cost of service and time consumed were found to be predictors of early treatment-seeking behaviour for malaria. Strengthening strategies tailored to increasing awareness for communities about malaria, importance of going hospital and early treatment-seeking behaviour is essential.

In order to tackle leading challenges toward prompt treatment seeking behaviour, there are needs to be provided including improved orientation toward malaria illness through mass media and other sources, education to health care provider to both medical and paramedical personnel with

regard to changes in treatment policy. Also, the need to inform and educate patients and drug vendors on changes in treatment policy should not be neglected.

DECLARATIONS

Ethics and Consent

Ethical clearance for conduction of this study was obtained from joint CUHAS-BMC research and ethics review committee No. 1824/2021 and permission from Medical officer in charge of Sekou-Toure regional referral Hospital FA.137/264/O1J/14. Written informed consent was obtained from participants and confidentiality was guaranteed. No participant name filled in the form to ensure confidentiality and right to withdraw from the study.

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