

Original Research Article

**DETERMINANTS AND MANAGEMENT OF PATIENT WAITING TIME IN THE
GENERAL OUTPATIENT DEPARTMENT.A CASE STUDY OF KIBABII
UNIVERSITY HEALTH CLINIC.**

ABSTRACT

The purpose of this article is to determine the time that a patient can spend waiting for services in Kibabii University Healthcare Clinic. The main objective was to provide necessary information to service facility managers, stakeholders, hospital staffs and other related institutions with the knowledge to improve the queuing system or to curb long waiting time of patients seeking services which can cause deterioration of the disease and sudden demise. This project also aims at providing suggestions to various factors identified to be the causes of long waiting time in the outpatient department at kibabii University healthcare to help the smooth running of the clinic. The ODK tool was used in data collection procedure to capture the opinions of the respondents. The results from the ODK Tool was exported to XLS which is an export feature of data to excel, later data was exported to SPSS for analysis from excel.

Keywords: Queuing models, outpatient department (OPD), average patient treatment, Markov Chain

1. INTRODUCTION

In order to respond to the demand of service on time and efficiently, many institutions use queuing models. However, the use of queuing models is not widespread in hospitals. Regarding the efforts made by health facilities to prevent the harms that can be caused by delay of service, factors brought out in this study include long lack of commitment, shortage of health providers, heavy flow of patients to be served and minimal rooms for service seeking.

Moreover, studies in the United States about the patient waiting time have found the average waiting time to be twice the recommended time for acute patient according to Horwitz et al. 2010, also a report in 2014, from the Centre of Disease control found that the average patient treatment time was 90minutes.

A study research carried out in Kenya in an Outpatient department in Kenyatta National Hospital found that 33.7% of the respondents reported that waiting to be served by doctor's made the delay (Mwanga 2013)

1.1 Statement of the Problem

Long waiting time of patient before being served by health service providers has been a threat to patients not only in Kibabii university health clinic but also a worldwide disaster to health care institutions leading to continued suffering, worsening of the disease resulting to sudden demise of our beloved. Lack of technicality in the subject matter about the causes of long waiting time has caused pain to many families leading to declination of the country economy, this probes a need for more researches about management of patient waiting time in general (Singh, 2011).

1.2 Significance of the study.

This text is based on the perceptive that most of these challenges can be managed by using queuing model to determine the waiting time performance such as: average arrival rate of

patients, average service rate of patients and related factors leading to long waiting time. This will help the various stakeholders, facility managers, CEO'S of various health institution to come up with related mechanisms to minimize long waiting time in hospitals mostly in the outpatient department (OPD)

2.0 Methodology.

The text used the Queuing theory model with different queuing disciplines including first-in-first serve (FIFS) and last-in-last serve excluding the random order (RO) and the last-come- first serve (FCFS) since the arrival time was directly proportional to the service time therefore resulting to formation of the Que. Queuing theory has its origin in research by Agner Krarup Erlang when he created model to describe the Copenhagen telephone exchange (Sundarapandia 2009). The idea applied in telecommunication, traffic engineering, computing and the design factories, hospitals (Schlechte. 2009)

2.1 Queuing theory

Waiting for services has become an integral part of daily life, generally the queuing system consist of one or more queues and one or more servers that operates under set procedures. Many researchers used the queuing theory including Stordahl, 1972, Christiaan Huygens, 1657, Andrew Markov the famous scholar named after the markov chain process

2.1.1 Kendell notation

The basic queuing model can be categorized using the Kendell notation (Kendell, 1953).

The M/M/c Queuing System

The model that used was *MMC* FIFS/ ∞/∞ (Kleinrock, 1975) where;

M=Markovian (or Poisson) arrivals and exponential service time.

C= Multi-server; where in our case *c* is equal to three nurses working in outpatient department.

According to a copy made in (2000 by William Stallings) available at (WilliamStallings.com/student Support.

FIFS = First in, first served.

∞ = Infinite system limit.

∞ = Infinite source limit.

n = are the number of outpatients

Size of the calling source is infinite

The steady state formula to obtain the probability of having n number of outpatient in the system p_n and the formula for p_0 , l_s , l_q , w_s , and w_q are presented below

This system can be modeled as a birth-and-death process with the coefficients

$$p_n = \begin{cases} \frac{\phi^n}{n!} p_0 & 0 \leq n \leq c, \\ \frac{\phi^n}{c^{n-c} c!} p_0 & n > c \end{cases} \quad \text{where } \frac{\phi}{c} < 1 \text{ or } \frac{\delta}{\mu c} < 1$$

$$p_0 = \left(\sum_{n=0}^{c-1} \frac{\phi^n}{n!} + \frac{\phi^c}{c^{c-1} c!} \right)^{-1}$$

$$l_q = \frac{\phi^{c+1}}{(c-1)! (c-\phi)^2}$$

$$l_s = l_q + \phi$$

$$w_q = \frac{l_q}{\delta}$$

$$w_s = w_q + \frac{1}{\mu}$$

3.0 RESULTS FINDINGS AND DISCUSSION.

In this topic, the impression of the study is brought out clearly using the results obtained during the data analysis, necessary discussions are made which help in drawing of various conclusions, as follows.

3.1 Data Analysis

Gender of the respondents

Table 1

Gender of the respondent					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	33	45.2	45.2	45.2
	Female	40	54.8	54.8	100.0
	Total	73	100.0	100.0	

The table above displays the gender of the respondents showing that out of 73 respondent's 33 were female and 40 were male

Table 2 **Waiting time of a patient**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid <5Minutes	11	15.1	15.1	15.1
5-20Minutes	10	13.7	13.7	28.8
21-35 minutes	1	1.4	1.4	30.1
21-35Minutes	12	16.4	16.4	46.6
36-51Minutes	19	26.0	26.0	72.6
>52Minutes	20	27.4	27.4	100.0
Total	73	100.0	100.0	

97 **Waiting time of patients in OPD**

98 The table above showed that 27.4% of the respondents said that a patient can spend more than 52
99 minutes waiting for the service before being attended by a nurse. This implied that there is an effect
100 of long waiting time in the Kibabii university health clinic.

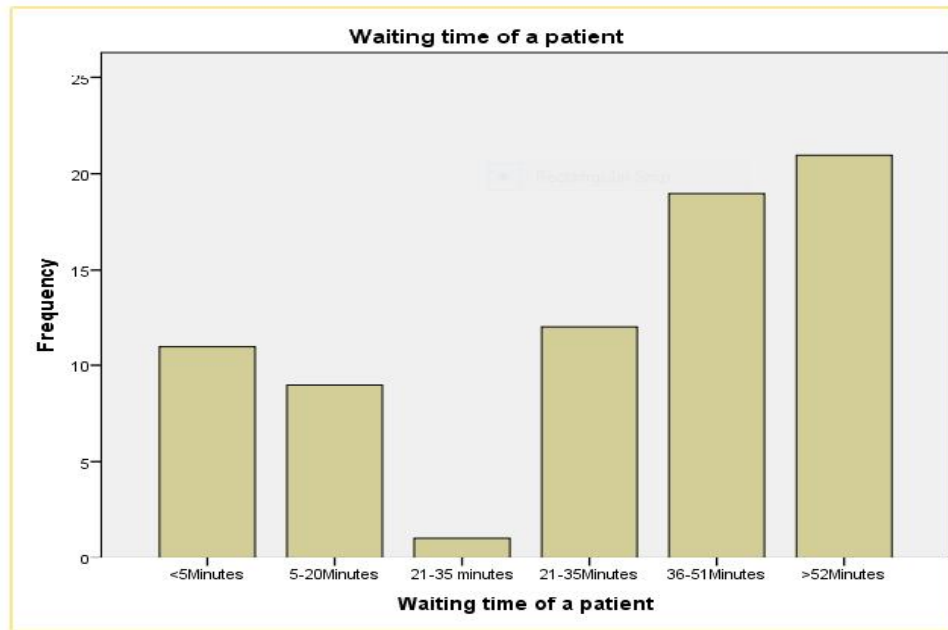


Figure 2

Attitude of the patients towards the waiting Time

A percentage corresponding to 37% of the respondents said that they were comfortable with the



Figure 2

long waiting time while 63% of the respondents disagreed with the long waiting time.

Causes of long waiting time.

Table 3.

Causes of long wating time in an outpatient department					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	shortage of nurses and pysicians	20	27.4	27.4	27.4
	Lack of dedication of staff to their duty	21	28.8	28.8	56.2
	Shortage of consultation rooms	10	13.7	13.7	69.9
	Heavy flow of patients in the clinic	22	30.1	30.1	100.0
	Total	73	100.0	100.0	

This showed that that the interviewed students and staffs raised up that 30.1% heavy flow of patients in the clinic is the main reason, followed by lack of dedication of staff to their duty 28.8% also shortage of staffs which amounted to 27.4% for long waiting time in Kibabii university health clinic in an OPD.

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Solutions for the long waiting time

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According to the interview conducted on students and staff about the long waiting time in

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Kibabii University clinic 35.6% of the respondents proposed increase of number of nurses,

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23.3% proposed reduction of the steps followed by a patient before being seen by a nurse.

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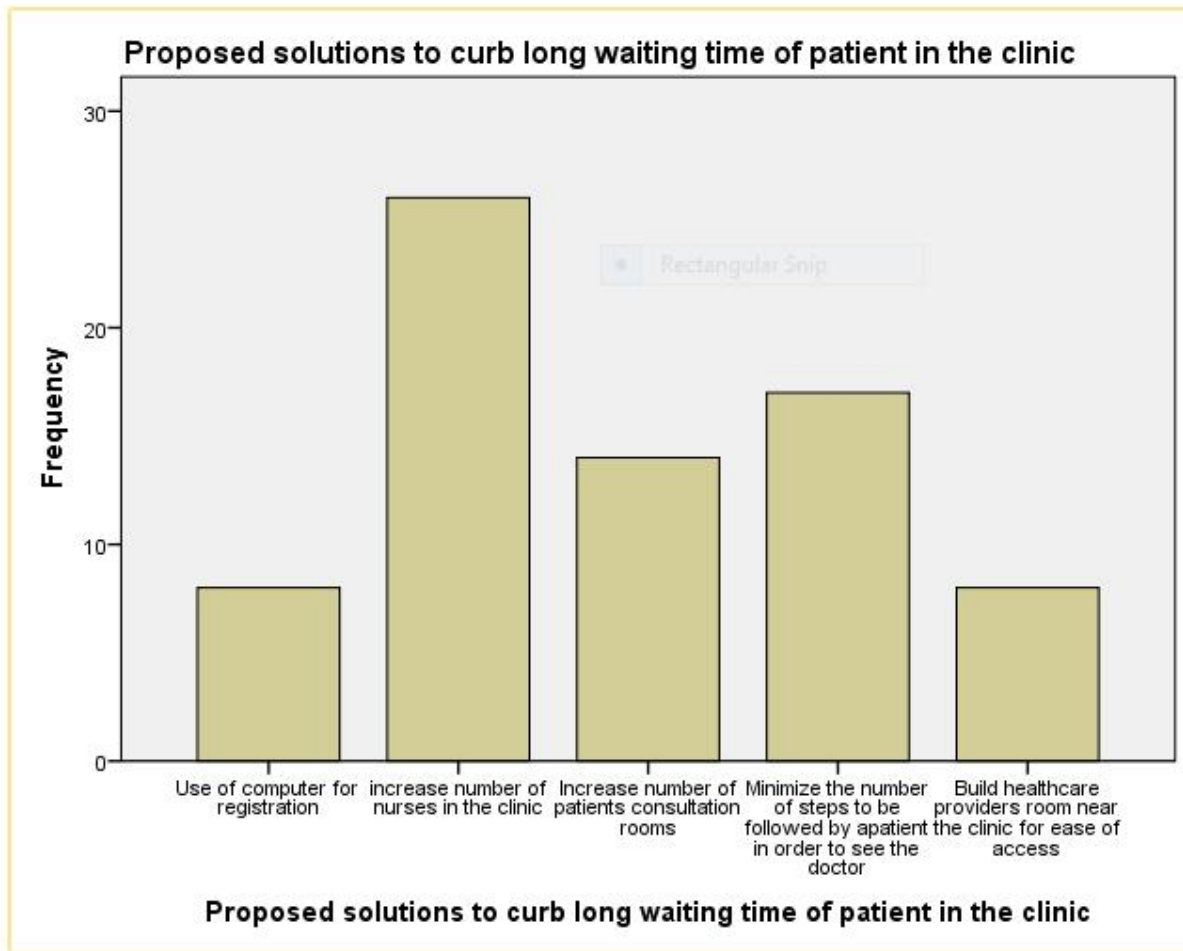


Figure 3

Conclusions.

The study showed that most of patients waited for more than 52 minutes before being served by the service providers, the study showed that the main cause of long waiting time in an outpatient department was the high number of patients in the line. The possible suggestion made to the most trouble shouting problem was, increasing number of physicians and nurses to assist in provision of services.

Recommendations

The following were the recommendations.

- i. Since the service providers are the subject to the long waiting time they should be highly dedicated to serve so as to minimize the long waiting time that cause prolonged pain and sudden death.
- ii. Since long waiting time has been a threat to health facilities worldwide studies should be done to come up with various methods of minimizing long waiting time not in OPD but also in IPD.
- iii. The government should provide support by providing more training of nurses to help in various hospitals.

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168