Hospital Waiting Time, Satisfaction with Services and Patient Arrival Patterns among Primary Care Attendees in a Tertiary Hospital: The Need for Time Specific Appointment Systems.

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Abstract:
Background*: Waiting time in Nigerian public hospitals is excruciatingly long with negative impact on quality of care, client satisfaction and utilization of health care services. These factors have significant negative consequences on the health indices of the population. Waiting time is amenable to easy objective and subjective assessment and intervention and hence studies are required to provide evidence for quality improvement.*
Aim and Objectives*: to evaluate the pattern of waiting time and relationship with clients' satisfaction with services in the clinic.*
Materials and Method*: three hundred randomly selected subjects were administered a combination of customized questionnaire and modified SWOPS questionnaire. P value was .05.*
Results*: majority of respondents were educated (74%), young (62%) and females (58.4%).*
Most of the clients (40%) arrived at the clinic before 8am. Waiting time (WT) ranged 19-360 mins. (mean =107minutes) and was longest at the pre consultation interval. WT varied significantly with arrival time (X^2=107.9, p=.000) and was not significantly related to perception of waiting time and satisfaction. Perception of WT was good (mean=3.27/5) and significantly related to satisfaction with treatment (Likelihood Ratio=88.0 p=.000) and services (Likelihood Ratio=117.9, p=.000).
Conclusion*: this study demonstrated that the unacceptable waiting time was caused by uncoordinated client arrival patterns and that the dynamics between duration of waiting time and clients' satisfaction is modulated by satisfaction with treatment received offering a trade-off for the long duration of waiting time. Queue management using appointment system will modify the arrival pattern of clients, improve waiting time, client experience and satisfaction.*
Keywords:waiting time, client's perception, satisfaction, arrival patterns, appointment systems

I. Background:

Timeliness of health care services is a dimension of Quality of care as defined by the Institute of Medicine of the United States.[1] Waiting time in hospitals is a major concern in health systems worldwide.[2]Timeliness is important because of the impact of waiting time on patient perception of quality of care, utilization of facilities and choice of facilities to use.[3] It is a determinant of health seeking behavior at population level as it negatively impacts on decision for early presentation in any illness episode resulting in poor morbidity and mortality indices for the nation.[4,5,6,7] Poor utilization of hospitals renders the available health care resources inefficient at achieving desired health outcomes corroborating the World Health Organization statement that low quality health care is expensive.[8]

The quality of health care has received inadequate attention in Nigeria compared to developed countries with the consequence of slow development of the system even when compared to the available resources.[9] The lack of a quality management culture has resulted in inefficient utilization of resources and lack of modification of service processes to improve efficiency and patient experiences. There is wide spread negative view and lack of trust of the health sector especially public health services.[9,10,11]

Studies have established that waiting time in most Nigerian hospitals is excruciatingly long, contributes to low satisfaction, delayed presentation to hospital with increased morbidity and mortality, patient walk outs and reduced revenues and business sustainability of the health institutions.[7,9,12,] Lack of timeliness also affects the morale of workers resulting in burn out and consequent poor provider-patient relationships.[13]It is an indicator of hospital performance and managerial effectiveness.[2,12,14]

Waiting time in the hospital refers to the amount of time clients wait to access desired health services. In an outpatient facility, waiting time is divided into several components: pre-process waiting time which is the amount of time taken to access consultation with the doctor. The time taken to access care at other service windows like the laboratory, radio-diagnostics units and the pharmacy are regarded as In-Process waiting time. Through-put time is the sum of all the time taken from entry to exit from the facility.[12,14]

Waiting has both psychological and physiological consequences which for the patients include anxiety, frustration, sense of powerlessness or lack of control and stress.[15] These lead to dissatisfaction and aggressive attitude towards the providers.[13]Waiting time also contributes to the cost of accessing health care as time spent in the hospital results in loss of productivity as an opportunity cost to health.[9,12] It constitutes a major barrier to early presentation as most people will not present to the hospital on time for what they consider to be minor ailments which would not justify the direct and opportunity cost of a hospital visit.[7,9,10]Anecdotal evidence suggests that members of the public would rather visit chemists and other private hospitals despite knowing that better quality and safer care exists in teaching hospitals due to the waiting time factor.

The Institute of Medicine in the USA set the benchmark of 30 minutes for pre-process waiting time in primary care.[16] Also the Patient bill of rights in Nigeria stipulates that patients are entitled to receive services within 30 minutes of arrival at a health facility.[17] However this is far from the existing reality as studies have shown that patients experience excruciatingly long waiting time in Nigerian hospitals.

In a tertiary hospital in Sokoto, North West Nigeria, through put time had a mean of 168minutes, in National Hospital Abuja, the range was 10-432minutes while in a tertiary hospital in Port Harcourt, range was 80-525minutes.[7,18,19]

The interaction between waiting time and patient satisfaction in the Nigerian studies however demonstrates varying dynamics. Despite the stated dissatisfaction with waiting time, satisfaction with quality of care in those studies were mostly high. In the clinic of a tertiary educational institution in South West Nigeria, Obamiro found that among a patient population that was 100% educated, 27% considered the waiting time normal and adequate, 32% were satisfied with it, and 52% felt it was too long.[20] However, the study population expressed satisfaction with the services in spite of the long waits. He attributed this to a culture of long waits in Nigerian hospitals. The attributed causes of the waiting time were, large number of patients, late arrival of doctors, inadequate number of doctors, lack of information and communication technology facilities, long consultation time and lack of queue discipline.[20]

In Sokoto, where only 36% of the study population had tertiary education, the main causes of dissatisfaction were the long waiting time and poor condition of the consulting rooms. The patients scored the doctors 48.5% on communication and 65% on explanation, neatness of the hospital was scored 65%. Overall satisfaction was scored 52%.[7] In a tertiary hospital in Kano, Northern Nigeria, satisfaction was rated 83%. Patient provider relationship, hospital facilities, in-patient services and access were good. Cost and waiting time were the main causes of dissatisfaction.[21]

The significant relationship between duration of waiting time and satisfaction with services was demonstrated in studies in tertiary hospitals in Abuja and Benin City.[18,22]In both studies, more than 70% of respondents expressed satisfaction with services but significantly more of those who experienced long waiting times reported less satisfaction with services.[18,22]

In Enugu 63.9% of the patients were dissatisfied with the waiting time and 99% would be willing to pay more to get better quality care and drugs. The author noted that these were major barriers to access and utilization of the facility.[23]

The effect of the tradeoff between pre-process waiting and duration of consultation on satisfaction is demonstrated by the study in Makurdi North Central Nigeria where it was found that a combination of long pre-process time and short consultation resulted in the lowest satisfaction scores.[24] Other significant factors included the amount of information from the doctors and the hospital environment.

In Calabar, prolonged waiting time was caused by inefficiency in the records unit and inadequate staffing.[25]

The foregoing shows that the relationship between actual wait time, it's perception and satisfaction rating of services is complex. The quality of a service as perceived by the clients is adjudged from the sum of the performance of the various components of the service. The perception of satisfaction with services is determined by the differential between client expectations which incorporates their needs and values and their experience of the service. The literature on quality of care has evidenced that this dynamic is complex and influenced by factors related to the patient, their sociopolitical and economic environment.[26,27,28,29]For the Nigerian populace, the fact that tertiary hospitals have the best offer of ethical, safe and quality treatment modulates their expectations and perception of experience and satisfaction. However, despite the satisfaction expressed by respondents in these studies, the impact of waiting time on health seeking behavior and productivity demands attention. This is more so as waiting time is highly amenable to objective and subjective assessment and intervention.

The factors that mediate waiting time include: arrival pattern of clients, the organization of service points, proper co-ordination between service points, efficient and adequate number of staff at the service points, staff attitude (service orientation), information dissemination to patients, availability of information and communication technology facilities to ease work flowetc.[12,14,20] Developing countries like Nigeria share a deficiency in these areas with consequent increase in inefficiency and cost of services to both clients and the system. These factors make the hospital process a complex queuing system amenable to evaluation and modification based on the queuing theory.[12,20] The queuing theory explores the process of service to determine causes of delays and inefficiency with a view to improve efficiency and minimize cost. The parameters include source population and arrival pattern of clients, the existence of a queue and the order in which the clients are served (queuing and queuing discipline), service mechanism (number of service points, available staff and the length of time per serve and coordination of different units in the service chain) and exit. In developed countries appointment systems have been used to control patient flow such that they arrive at a rate the staff and facilities can cope with thereby reducing waiting time.[30]This is also evidenced in the study in a developing country, Ethiopia where waiting time (WT) was reduced from 395 minutes to 165 minutes by use of appointment system.[31]In Nigerian hospitals, with the absence of an appointment system, arrivals are usually overwhelming, making long waiting time inevitable.[18,20]

Given the wide availability of mobile telephone technology in Nigeria estimated at 204 million subscriptions and tele-density of 107.2%, time specific appointment systems are feasible and requires the managers of the health care system at macro and micro levels to harness this to improve waiting time.[32] The negative impact of long waiting time on patient satisfaction and health seeking behavior, makes it imperative to prioritize interventions to achieve a minimization of waiting time and optimization of the quality of care.[12,19]

Justification:
The waiting time in most hospitals in our country is unacceptably long resulting in wide spread dissatisfaction and poses a major barrier to population utilization of health services resulting in unacceptable morbidity and mortality rates.[4,5,6]A quality management culture is required to create necessary improvements to facilitate achievement of universal health coverage and better health outcomes.[12] This requires evaluation of quality of services including timeliness and its parameters to provide evidence to advocate for quality improvement interventions.

Aim and Objectives: to evaluate the pattern of waiting time and relationship with clients' satisfaction with services in the clinic.

II.   Methodology:

Study Area: The University of Benin Teaching Hospital is a tertiary hospital located in Egor Local Government Area of Benin City, the capital of Edo State Nigeria. It is a 910 bedded hospital offering training to a wide range of medical and paramedical professionals and all levels of care to the clients in Edo, Delta, Ekiti, Ondo and other neighboring states. The Family Medicine Clinic is located at one extreme of the hospital. It offers primary care services to patients every day and serves as the gateway to the secondary and tertiary care units of the hospital. The clinic is run by the Family Medicine Department of the hospital with residency training in situ and receives patients on a walk-in basis every day. At the time of this study about 150- 250 patients attended the clinic per day on week days and about 40-80 patients on weekends. It opened at 8am and closed at 6pm. It has medical, nursing, records, revenue, laboratory and pharmacy units. Radio diagnostic services are located in the main hospital within some walking distance. There is usually a minimum of ten doctors (Consultants and Residents) available to attend to the patients. Patients are required to pay for consultation and obtain their card from the revenue and records units respectively. Both units are adjacent to each other in the waiting hall. A patient flow management mechanism operates such that patients take numbers on arrival and queue discipline is maintained as much as possible in giving them access to the doctors for consultation. There is an information /help desk in the waiting hall giving patients all information required to facilitate their access to care in the clinic and the main hospital. There is a television set in the hall offering programs on local channels. The clients are given a health talk every morning by the nurses. Emergency cases are stabilized and then taken by ambulance to the emergency department in the hospital if needed. Most of the patients are students, artisans, traders, civil servants, retirees and business owners reflective of the communities the hospital serves.
Sample Population: This was made up of all clients that attended the clinic in the study period about 5480 patients in a month.
Selection Criteria: All Clients (patients or patient relatives) above 10 years of age who consented to participate were recruited into the study. All patients who were too ill to participate (and their relatives) were excluded.

Sample Size: The Leslie Kish formula was employed for sample size calculation using prevalence of patient satisfaction in Nigeria of 52%-91% an average of 71.5%.[7,33,34] Calculated sample size was 298.6 rounded to 300 for ease of data analysis.

Research Instruments:1) The Satisfaction with Out-Patient Services Questionnaire (SWOPS)was used with modification to include assessment of Pharmacist care.[35]The SWOPS is a standardized self -administered instrument developed by Seibert et al 1996 for measuring patient satisfaction with services in outpatient departments. It has six sections covering, Registration process, Nursing Care, Physician care, Information, Testing services and Overall satisfaction. The various dimensions have Cronbach alpha scores ranging from 0.84 -0.95. The parameters were rated on a 5-point Likert scale.2) A customized semi structured questionnaire to capture sociodemographic data and time taken to access services at different windows in the clinic. The instrument was interviewer administered for illiterate participants.

Sampling Method: Random sampling method by simple balloting was used.

Study duration: The calculated sample size of 300 was recruited over a period of October 2017 to February 2018. (December /January were skipped for logistic reasons) For the waiting time aspect of the study only 261 questionnaires were adequate for analysis.

Study Procedure: About 5 patients were recruited each day. The selected participants had the study explained to them. Informed consent was obtained, and they filled the questionnaire at their own pace as they went through the clinic for their care. The questionnaires were retrieved at the pharmacy which is the last service point in the clinic. Participants who were illiterate were assisted by a trained research assistant.

Ethical Consideration:
Ethical Approval was obtained from the hospital Research and Ethics Committee. PROTOCOL NUMBER: ADM/E 22/A/VOL.VII/1480. Informed consent was obtained from all the participants. Confidentiality was maintained in data collection, collation, analysis and reporting.

Data Analysis:
The data was collated using Microsoft Excel and analyzed with SPSS version 21. P value was set at 0.05. The distribution of satisfaction with the various components of services was done using frequencies and percentages. The 5-points Likert scale was scored 1-5 from poor to excellent. The mean of the scores for all the participants on each parameter was calculated as the satisfaction score for the parameter. Spearman correlation was used to determine the relationship between perception of service components and satisfaction. The independent sample t test was used to test the significance of the difference in waiting time parameters for the different arrival time groups.

III.   Results:

Distribution of Sociodemographic Variables among the Respondents (Table 1).
Majority of the respondents were adolescents (24.7%) and young adults (20-40years at 37.3%). 23% were elderly (above 60yrs) there were more females (54.8%) than males (45.2%). Majority had tertiary education (59.8%) and were Christians (95.4%).

Distribution of Respondents by the Time of Arrival at The Clinic (Table 2).
Most of respondents (40.2%) arrived at the clinic before 8am (early morning), 30.7% between 8am and 11am (mid-morning) and 29.1% beyond 11am (late morning).

Relationship between Sociodemographic Characteristics and Arrival Time Group among the Respondents (Table 3).
The relationship between Sociodemographic Characteristics (gender and educational status) and arrival time of respondents was not statistically significant.

Pattern of Waiting Time at the different Service Windows of the clinic (Table 4).
The range of throughput time for all the respondents was 19-360mins with a mean of 107mins. Mean waiting time at service windows wasshortest at the laboratory (19.7mins) and longest at pre-consultation interval(48.7mins) accounting for 40% of throughput time. The proportion of clients attended within 30mins at the service windows shows that turn-over was highest at the laboratory (93%), pharmacy (86.2%), registration (80%) and lowest at the pre-consultation window (42%).

Distribution of Through-put Time Category among the Respondents (Table 5).
Most of the respondents experienced a long waiting time (60-119 mins) to access services in the clinic while 24.1% experienced a short WT (<60mins) and 27.2% spent a very long WT (> 2hours).

The Pattern of Waiting Time segments by Arrival Time Groups (Table 6).
The mean throughput time and interval WT at all the service windows were highest for the early morning group and least for late morning group. The registration time was significantly lower only between mid and late morning groups (t=4.230 p=.000). Pre-consultation WT was significantly lower from early (t=2.252 p=.012) to mid (t=5.003 p=.000) and late (t=8.094 p=.000) morning groups. For the lab, the difference in mean WT was

not significant between the groups. For the pharmacy there was no significant difference between early and mid-morning groups but the difference between mid and late morning groups (t=2.744 p=.007) and between early and late morning groups (t=2.840 p=.005) were significant. The throughput time was significantly lower between early and mid-morning (t=3.003, p=.003) and mid and late morning groups (t=6.052 p=.000) and between the early morning and late morning group (t=8.608 p=.000).

Relationship between Arrival Time Group and Through-put Time among the Respondents (Table 7).
There wsa a high statistically significant relationship between the arrival time of the respondents and the total time spent accessing services in the clinic. X^2=107.983 df =4, p=.000

Distribution of Perception of Waiting Time and it's Categories among the Respondents (Table 8).
Most of the respondents perceived the waiting time as good (47.5%), and very good (37.5%). Only 14.9% considered it poor. The mean score of perception of waiting time was 3.27/5.

Distribution of Respondents by the Perceived Level of Frustration at the Service Windows (Table 9).
Majority of the respondents (49.4%) considered the pre-consultation waiting time most frustrating. Registration was next at 22.6% and then pharmacy. The laboratory was the least frustrating.

Relationship between Sociodemographic Characteristics and Perception of Waiting Time among the Respondents (Table 10).
The relationship between sociodemographic characteristics (gender and educational status) and perception of waiting time were not statistically significant.

Relationship between Arrival Time Group and Perception of Waiting Time among the Respondents (Table 11).
The relationship between time of arrival of respondent and perception of waiting time was not statistically significant. X^2=4.542 df =4, p=.338

Relationship between Through-put Time and Perception of Waiting Time among the Respondents (Table 12).
The relationship between throughput time and perception of waiting time was not statistically significant. X^2=5.892 df =4, p=.207

Distribution of Rating of Satisfaction with Services among the Respondents (Table 13).
Most of the respondents (44.1%) rated the services as good (score of 3/5), 39.8% rated services as very good and 8.5% as excellent. The mean satisfaction score was 3.57/5.

Relationship between Sociodemographic Characteristics and Satisfaction with Clinic Services among the Respondents (Table 14).
There was no relationship between gender, educational status and satisfaction with clinic services.

Relationship between Arrival Time Group and Satisfaction with Clinic Services among the Respondents (Table 15).
The relationship between time of arrival of respondents and satisfaction with services was not statistically significant. X^2=4.447 df =4, p=.349. (fishers)

Relationship between Through-put Time and Satisfaction with Clinic Services among the Respondents (Table 16).
The relationship between throughput time and respondent's satisfaction with services was not statistically significant. X^2=2.448 df =4, p=654 (fishers)

Relationship between Perception of Waiting Time and Satisfaction with Clinic Services among the Respondents (Table 17).
The relationship between perception of waiting time and satisfaction with services was highly statistically significant. X^2=117.931 df =4 p=.000, Likelihood ratio=111.430 p=.000

Relationship between Satisfaction with Treatment and Perception of Waiting Time among the Respondents (Table 18).
The relationship between satisfaction with treatment and perception of waiting time was highly statistically significant. X^2=96.350 df =4 p=.000. Likelihood ratio=88.011 p=.000.

Correlation between Waiting Time at Service Windows and the perception of the Services at the Windows (Table 19).
There was no significant correlation between actual waiting time at service windows and the perception of the services experienced at the windows. However, there was a significant moderate positive correlation between the perception of the service at various windows and the perception of waiting time and satisfaction with clinic services.

IV. Discussion:

This study utilized a modified satisfaction with outpatient services questionnaire to explore the clients' perception of service components, satisfaction with them and the dynamics between them. Three hundred respondents were recruited but only 261 responded adequately with the complete time data, the analysis of which is presented here.

The respondents were mostly educated (>74%) and young people under 40years in keeping with the population that choose the clinic for their care. This demographic distribution is similar to that found in other tertiary hospitals in Abuja, Sokoto, Kano and Port Harcourt, Nigeria.[7,18,19,21,] This suggests that it is young educated clients that seek care at the tertiary hospitals. It is also reflective of the demographic distribution of the country.

The process map of the clinic shows the clients go through registration (including payment at revenue unit), waiting hall pre-consultation, consultation, then laboratory and the pharmacy as needed. In this study 100% of the respondents registered and consulted the doctor while 69% visited the laboratory and 68%, the pharmacy.

About 100 patients (40%) of them arrived at the clinic before 8am (early morning) and about 30% arrived mid-morning (8-11 am) while the rest arrived beyond 11 am (late morning). This is similar to the finding in National Hospital Abuja, where majority of the patients arrived before 11am with a median time of 8am.[18] The reason most of the clients came so early was to ensure they got to see the doctor and also within reasonable time. The arrival time of respondents is not significantly associated with sociodemographic characteristics showing that the anxiety and effort to ensure access to care was not determined by education or gender. However, this does not yield the desired outcome due to the overcrowding in the morning clinic.

The massive early arrival overwhelms the available staff. The process map of the clinic shows there are about 10 doctors per day seeing patients at about one per 15 minutes consultation slot. At that arrival rate, ab initio, each doctor had 10 patients who had arrived before 8am waiting. At the rate of 4 patients per hour, the 10th patient inevitably had to be seen 2.5hrs after registration. A pre- process waiting time that is unacceptably long. This scenario is similar to that found in Abuja.[18]

The registration service window had a waiting time (WT) range of 2-250 minutes with a mean of 29.2 minutes representing about 24% of the through put time. This is similar to that in National Hospital Abuja (NHA) and University of Port Harcourt Teaching Hospital (UPTH).[18,19] About 32% of the clients received service within 10 mins and about 80% within 30 min showing a good waiting time and confirming rapid turnover of clients at this window. This is similar to findings in PH but better than findings in the Sokotostudy where 74% of clients waited 60-120 mins to get registered.[7]

The pre-consultation WT ranged from 5-276mins with a mean of 48.7 mins. This was shorter than in the National Hospital with a range of 0-336mins and median of 60mins and also shorter than found in UPTH (mean of 82mins).[18,19] About 4.2% of respondents accessed the doctor within 10mins and 42% within 30mins showing that majority of the clients didn't get to see the doctor within the 30mins recommended by the Institute of Medicine (USA)and contrary to the stipulations of the patient bill of rights in Nigeria.[16,17]

Most of the respondents considered the pre-consultation interval the most frustrating in keeping with the low responsiveness and slow turnover at that window. There was a weak negative correlation between the length of the pre-consultation interval and satisfaction with services. This is in keeping with literature and similar to the cited previous study in the same study site and in UPTH where this service window recorded low satisfaction rate compared to others and had a large negative impact on satisfaction.[19,36]

The WT at the laboratory ranged from 2-240mins but had the lowest mean at 19.7mins. About 42% of the clients were served within 10mins and 93% in 30mins confirming very high responsiveness and rapid turnover at this service window. This was better than that found in UPTH where mean WT at the laboratory was found to be 50mins. The laboratory was perceived as the least frustrating also reflecting the turn over indices at that window but contrary to UPTH where it was rated the least satisfactory.[19]

The WT at the pharmacy had the shortest range at 2-75mins but the mean of 22.8mins was comparable to registration and laboratory service windows. The 10-minute turnover was 20.2% and 86.2% at 30 minutes confirming high responsiveness and turn over. The mean WT is similar to that in UPTH (27mins), but longer than the mean WT of 17 minutes in the study by Afolabi and associates in Ife.[37] It is much shorter than the 55mins post-intervention found by Ndukwe and others who utilized a modification of the queuing mechanism and improvement in queue discipline to reduce WT from 167minutes to 55 minutes in their study site.[38]

The distribution of through put time (TPT)in this study population showed a range of 19-360mins and mean of 107mins. This is shorter than in NHA (range 10-432mins, median 60mins) UPTH (range = 80-525, mean 274mins) and in Sokoto (mean =168mins).[7,19] Most (49%) of the respondents experienced a long waiting time (1-2 hr) and about 24% spent less than 60 minutes to complete their care process in the clinic. This pattern is better than in Sokoto where majority spent about 3hrs or more.[7] The pattern of TPT shows that those who arrived the clinic before 8am had a range of 21-360min and mean of 139 minutes. Only 5(4.8%) respondents experienced a short TPT while 49 respondents (47%) experienced very long waiting time. This is in contrast to those who came in the late morning group where 48 respondents (63%) experienced short WT and only 2

respondents had very long WT. This demonstrates the impact of client overcrowding in the early morning on the finite clinic service resources. Late morning clients had a better experience because by their time of arrival, most of the crowd had been cleared and so queue lengths had reduced. This confirms that arrival pattern is the main cause of long WT in this clinic. Although other factors like staff adequacy, absenteeism and service orientation were not evaluated in this study, addressing the arrival pattern using appointment system will definitely go a long way to reduce the excruciating long waiting time experienced in this clinic like others around the country. This is very important given the fact that most people come early in the morning, abandon their work and spend 2-3hrs of the morning in the hospital thereby making it impossible for them to achieve meaningful productivity on their jobs for that day. This is a major factor in the cost of health care utilization as work productivity is rendered an opportunity cost for accessing health care therefore deterring most of the population from utilizing the services. It is also a major factor promoting delayed presentation to hospital and use of substandard alternatives like chemists and herbalists who offer more prompt and less cumbersome processes.[10,12]The consequence on the morbidity and mortality status of the nation is evident in our poor health indices.[4,5,6]

A break-down of the pattern of waiting time at the service windows showed significant variation by the arrival time groups. Waiting time was lower across all service windows for the mid-morning and late morning groups. The differences were highly significant for the registration, pre-consultation and through put time especially between early and late morning groups. The difference between these arrival time groups for the laboratory was not significant showing that client turn over did not vary significantly across the day. This is probably because not all respondents went to the laboratory and that the service process is simpler and brief. Also, the clients have to see the doctors first before going to the laboratory and so their arrival at the laboratory is regulated by the doctors' turn-over rate thereby reducing crowding and waiting time. The difference in the Pharmacy WT between the early morning and mid-morning was not significant. However, between mid and late morning, and between early morning and late morning groups were significant. Arrival at the pharmacy is also determined by doctors' turnover but the process of care at the pharmacy involves multiple service points which probably allows for clients to back up thereby reflecting the crowding in the arrival time groups.

The 30-minute turnover rate at all the service windows was more than 80% except for the pre consultation interval. This shows that if arrival is regulated, probably close to 100% of clients will be served within 30minutes at each window especially in the pre-consultation window with positive run off effect on the other windows and through put time. This provides evidence that queue management via appointment system to modify arrival patterns will impact positively on the duration of WT for most of the clients. This will especially impact on the pre consultation time which has proved to be the rate limiting step in the service process. An appointment system that tailors the arrival of patients to match the critical service mechanism (available number of doctors and the consultation time per patient) will effectively reduce the WT and patient over-crowding and improve the turn-over rate at service windows.[12, 20]

The distribution of perception of waiting time shows that majority of the respondents (85%) rated the WT as good or very good with a mean rating score of 3.27/5. There was no significant relationship between TPT and perception of WT. The proportion of satisfied patients is higher than in Kano where 70% rated the WT as good. The rating of perception of WT is in contrast to the distribution of through put time that showed majority (75.9%) waited about 1-2hrs and more to access care. Majority of the respondents rated their perception of WT as good despite the long duration. This finding is similar to that by Obamiro in South West Nigeria and in UPTH where 77.2% were satisfied with a WT in the range of 80-525mins.[19,20] In Enugu WT was a major cause of dissatisfaction but clients expressed satisfaction with services despite this.[23]

Despite the significant difference in WT between arrival time groups, there was no significant relationship between perception of waiting time and arrival time group. This goes further to buttress the assertion that actual length of time spent did not determine perception of WT among the respondents in this study.

The relationship between perception of waiting time and sociodemographic characteristics was not significant contrary to expectation that more educated persons as found in this study population may be more discriminatory and express dissatisfaction with services especially WT.

The distribution of rating of satisfaction with services in the clinic showed majority (95.4%) of the respondents rated the services as good or very good with a mean score of 3.57/5. This proportion of satisfied clients is higher than in the Kano study (83%) but the rating score is lower than in Enugu(3.75).[39] There was no significant relationship between sociodemographic characteristics and perception of satisfaction with services contrary to expectation*.*

The relationship between through put time and satisfaction with services was not significant. Also, there was no significant relationship between arrival time of clients and satisfaction with services despite the significant differences in waiting time experience of the arrival time groups. These confirm that actual length of time spent accessing services did not impact respondent's rating of satisfaction with services. This is contrary to findings in National Hospital and the cited previous research in the same study site that found a significant relationship between satisfaction with medical care and duration of WT. Also, contrary to this study, the

findings in UPTH was that of a significant negative correlation between satisfaction with services and duration of WT at all service windows and through put time.[19] This is possibly explained by the fact that in these studies, satisfaction with other service components(staff behaviour, treatment, environment , information etc) was not assessed and thereby eliminated the trade-off effect of satisfaction with those components.[40,41]

However, the relationship between perception of waiting time (PWT)and satisfaction with services was highly significant (X^2=111.430, p=.000). This suggests that the value attached to the services received determined respondents' rating of the acceptability of WT. Those that were highly satisfied with the services received considered the WT as good or very good irrespective of the actual length of time spent. This is similar to findings in NHA and by Obamiro in Lagos. It is recognized in literature that the value attached to a service determines how long clients are ready to wait for it.[19,42] Also, perception or satisfaction is a product of complex cognitive and affective integration of what is valued, expected and experienced.[19,26] The respondents in this study may be more disposed to wait for "valuable" health services especially in our environment where teaching hospitals are expected to offer better quality, safe and ethical care than other facilities. Also, the prevailing culture of long queues and poor responsiveness in most public facilities influences expectations and assessment of service experience.[20] Despite the well-known long waiting time and cumbersome protocols, those who value the services will continue to use it and modulate their expectations to minimize the differential with experience and so will express satisfaction.[43,44] This was demonstrated in the study at NHA where perception of WT and the degree to which patient's expectations was met were significantly related to satisfaction with services. It however calls to question the fact the performance of the health facilities cannot be completely adjudged from the satisfaction ratings of service users but should factor in the perception of non-users in the community. In this study, satisfaction with treatment was rated high (3.57/5) and the relationship with perception of WT was highly significant (X^2= 88.011, p=.000). Satisfaction with treatment is the clients' core value and expectation for a clinic visit and this therefore explains why respondents rated the WT as satisfactory irrespective of the duration. This trend was also shown across the service windows. There was no significant correlation between the duration of WT at the service windows and the respondents' rating of perception of services at those windows. However, the perception of services at these windows had significant positive correlation with perception of WT and overall satisfaction with services. These results further buttress the explanations offered above for the relationship between duration of WT, perception of WT and satisfaction with services. They also provide evidence for perception management approach to improve quality of care and client satisfaction.[42] Measures like comfortable, aesthetically pleasant waiting rooms, entertainment and health education are useful for improving the value of waiting time and it's perception.[42]

The rating of perception of WT (PWT) in this study population was however low compared to other service components (demonstrated in another paper).[45] It had moderate positive correlation with overall satisfaction with services suggesting a service gap (PWT score 3.27, Correlation with Satisfaction services= .565). This was confirmed with a high calculated service gap for WT(.503) which was higher than that for most other service components (range .290-.577).[45] This is evidence that despite the lack of significant impact of long waiting time on satisfaction, the clients indicate that the service gap for WT (differential between the rated importance of WT and rating of WT experienced) in the clinic is unacceptable and needs to be addressed.

V.   Conclusion:

This study demonstrated that the unacceptable waiting time was caused by uncoordinated client arrival patterns and that the dynamics between duration of waiting time and clients' satisfaction is modulated by satisfaction with treatment received offering a trade-off for the duration of waiting time. Queue management using appointment system will modify the arrival pattern of clients, improve waiting time, client experience and satisfaction.

Recommendation:
Appointment systems using mobile phones to grant clients open access to time specific consultation schedules should be instituted in the outpatient clinics.

Limitations:
The duration of consultation time was not measured and so it's contribution to through put time and interaction with other parameters were not studied.

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Tables:

Table 1: Distribution of Sociodemographic Variables among the Respondents.

Variable	Frequency	Percentage
Age		
10-19	**74**	24.7
20-29	58	19.3
30- 39	48	16.0
40-49	44	14.7
50—59	7	2.3
60—69	54	18.0
70>	10	5.0
Sex		
Male	**118**	**45.2**
Female	143	54.8
Educational Status		
None	**4**	**1.5**
Primary	63	24.1
Secondary	38	14.6
Tertiary	156	59.8
Religion		
Christianity	**249**	**95.4**
Islam	12	4.6

Table 2: Distribution of Respondents by the Time of Arrival at The Clinic.

Arrival time group	Frequency	%
Early Morning (before 8am)	105	40.2
Mid-Morning (8am-11am)	80	30.7
Late Morning (11 am and beyond)	76	29.1
Total	**261**	**100**

Table 3: Relationship between Sociodemographic Characteristics and Arrival Time Group among the Respondents.

Variable	Arrival Time Group			Total	X^2 P value
	Early Morning	Mid Morning	Late Morning		
Educational status					**X^2 =3.208**
Primary	26	22	19	**67**	**df=4**
Secondary	19	12	7	**38**	**p=.523**
Tertiary	60	46	50	**156**	
Total	**105**	**80**	**76**	**261**	
Gender					
Female	47	31	40	118	**X^2=3.046**

Male	58	49	36	143	**df=2**
Total	**105**	**80**	**76**	**261**	**p=.218**

Table 4: Pattern of Waiting Time at the different Service Windows of the clinic.

Waiting Time at Service Windows					
Parameter	**Registration.** (mins)	**Pre- Consultation** (mins)	**Laboratory** (mins)	**Pharmacy** (mins)	**Through Put Time(TPT)**
Range	2-250	5-276	2-240	2-75	19-360
Mean	29.2	48.7	19.7	22.8	106.957
Std. Deviation	42.933	39.883	31.996	12.344	73.506
% Mean TPT	24.3%	40.4%	16.4%	18.9%	100%
10 -minute turnover					
30- minute turnover	32%	4.2%	42%	20.2%	0%
Total Respondents					
	80%	42%	93%	86.2%	24.9%
	261(100%)	261(100%)	180(69%)	178(68.1%)	261(100%)

Table 5: Distribution of Through-put Time Category among the Respondents.

Through-put Time Category	Frequency	%
Short (<60 mins)	63	24.1
Long (60-119)	127	48.7
Very Long (>120)	71	27.2
Total	**251**	**100**

Table 6: The Pattern of Waiting Time segments by Arrival Time Groups.

Waiting Time Segment	Early Morning Group	Mid Morning Group	Late Morning Group	t- test Early vs mid morn grp	t- test Mid vs Late morn grp	t- test Early vs Late morn grp
Registration						
Range	5-250	2-206	3-53	t=1.887	t=4.230	t=4.754
Mean	42.66	28.80	11.13	p=.061	p=**.000***	p=**.000***
Pre-consultation						
Range	14-242	8-276	5-120	t=2.525	t=5.003	t=8.094
Mean	65.32	49.92	24.67	p=**.012***	p=**.000***	p=**.000***
Laboratory						
Range	5-240	2-120	4-180	t=.456	t=1.074	t=1.346
Mean	24.15	18.89	14.00	p=.649	p=.285	p=.181
Pharmacy						
Range	5-54	2-70	3-75	t=-.359	t=2.744	t=2.840
Mean	24.27	25.03	18.22	p=.721	p=**.007***	p=**.005***
Through-put time						
Range	21-360	20-332	19-305	t=3.003	t=6.052	t=8.608
Mean	139.76	107.75	57.66	p=**.003***	p=**.000***	p=**.000***

**Sig <.05, *Sig <.005

Table 7: Relationship between Arrival Time Group and Through-put Time among the Respondents

Arrival time Group	Through Put Time			Total	X^2 P value
	Short	**Long**	**Very Long**		
Early -Morn	5	51	49	105	X^2
Mid - Morn	10	51	19	80	=107.983
Late Morn	48	26	2	76	df =4
					p=.000*
Total	**63**	**128**	**70**	**261**	

*Sig <.005

Table 8: Distribution of Perception of Waiting Time and it's Categories among the Respondents.

Perception of	Freq.	%	Score	Total	Category	Freq	%

Waiting time				Score			
Poor	12	4.6	1	12	Poor	38	14.6
Fair	26	10.0	2	52			
Good	124	47.5	3	372	Good	124	47.6
Very good	77	29.5	4	308	Very	99	37.9
Excellent	22	8.4	5	110	good		
Total	261	100	Mean= 3.27	854		261	100

Table 9: Distribution of Respondents by the Perceived Level of Frustration at the Service Windows.

Frustrating Waiting Time Interval	Frequency	%
Registration	59	22.6
Pre-consultation	129	49.4
Laboratory	26	10.0
Pharmacy	47	18.0
Total	**261**	**100**

Table 10: Relationship between Sociodemographic Characteristics and Perception of Waiting Time among the Respondents.

Variable	Perception of Waiting Time			Total	X^2 P value
	Poor	Good	Very Good		
Educational Status					
Primary	6	30	31	**67**	X^2 =4.397
Secondary	7	17	14	**38**	df=4
Tertiary	26	77	53	**156**	p=.354
Total	**39**	**124**	**98**	**261**	
Gender					
Female					
Male	15	58	45	**118**	X^2=.859
Total	24	66	53	**143**	df=2
	39	**124**	**98**	**261**	p=.651

Table 11: Relationship between Arrival Time Group and Perception of Waiting Time among the Respondents.

Arrival Time Group	Perception of Waiting Time			Total	X^2 P value
	Poor	Fair	Good		
Early Morning	14	48	43	105	X^2=4.542 df
Mid- Morning	17	36	27	80	=4
Late- Morning	8	40	28	76	p=.338
Total	**39**	**124**	**98**	**261**	

Table 12: Relationship between Through-put Time and Perception of Waiting Time among the Respondents.

Through-put Time	Perception of Waiting Time			Total	X^2 P value
	Poor	Fair	Good		
Short	6	36	21	**63**	X^2
Long	18	56	53	**127**	5.892
Very Long	15	32	24	**71**	Df=4
Total	**39**	**124**	**98**	**261**	P=.207

Table 13: Distribution of Rating of Satisfaction with Services among the Respondents.

Rating of Satisfaction with Services	Freq	%	Score	Total Score	Category	Freq	%
Poor	2	0.8	1	2	Low	12	4.6
Fair	10	3.8	2	20			
Good	115	44.1	3	345	Moderate	115	44.1
Very good	104	39.8	4	416	High	134	51.3
Excellent	30	8.5	5	150			
Total	261	100	Mean =3.57	933		261	100

Table 14: Relationship between Sociodemographic Characteristics and Satisfaction with Clinic Services among the Respondents.

Variable	Satisfaction with Clinic Services	Total	X2

	Low	Mod.	High		P value
Gender					
Female	6	54	58	118	X^2=.454
Male	6	61	76	143	df=2
Total	**12**	**115**	**134**	**261**	p=.797
Educational Status					
Primary	3	29	35	65	
Secondary	2	12	24	38	X^2=3.400
Tertiary	7	74	75	156	df=4
Total	**12**	**115**	**134**	**261**	p=.757

Table 15: Relationship between Arrival Time Group and Satisfaction with Clinic Services among the Respondents.

Arrival Time Group	Satisfaction with Clinic Services			Total	X^2 P value
	Low	Mod	High		
Early Morning	4	49	52	**105**	X^2
Mid- Morning	5	39	36	**80**	4.447
Late Morning	3	27	46	**76**	df=4
Total	**12**	**115**	**134**	**261**	P=.349
					(Fishers)

Table 16: Relationship between Through-put Time and Satisfaction with Clinic Services among the Respondents.

Through-put Time	Satisfaction Clinic Services			Total	X^2 P value
	Low	Mod	High		
Short	3	25	35	63	X^2
Med	4	57	66	127	2.448
Long	5	33	33	71	df=4
Total	**12**	**115**	**134**	**261**	P=.654
					(Fishers)

Table 17: Relationship between Perception of Waiting Time and Satisfaction with Clinic Services among the Respondents.

Perception of Waiting Time	Satisfaction with Services			Total	X^2 P value
	Low	Mod	High		
Poor	9	17	13	39	X^2
Fair	2	87	35	124	117.932
Good	1	11	86	98	Df=4
Total	**12**	**115**	**134**	**261**	P=**.000***

*Sig <.005

Table 18: Relationship between Satisfaction with Treatment and Perception of Waiting Time among the Respondents.

Satisfaction with Treatment	Perception of Waiting time			Total	X^2 P value
	Poor	Fair	Good		
Low	7	1	0	8	X2=96.350 df
Mod	18	84	16	118	=4
High	14	39	82	135	p=.000*
Total	39	124	98	261	

*Sig <.005

Table 19: Correlation between Waiting Time at Service Windows and the perception of the Services at the Windows.

Service Parameter	Waiting Time at Service Windows			Perception WT	Overall Satisfaction Services
	Registration WT	Pre-consultation WT	Pharmacy WT		
Reg Process	-.093	--	--	.585	.491
	.134			**.000***	**.000***
Overall Dr Care	- --	-.041	--	.355	.504
		.509		**.000***	**.000***
Overall PH care	--	--	-.021	.357	.462
			.780	**.000***	**.000***
Perception WT	-.101	-.086	.001	1.000	.565

	.105	.164	.990		.000*
Satisfaction with	-.048	-.126	-.132	.565	1.000
Services	.442	.043**	.079	.000*	

*Sig <.005, **<.05

Dr V.O. Abah. "Hospital Waiting Time, Satisfaction with Services and Patient Arrival Patterns among Primary Care Attendees in a Tertiary Hospital: The Need for Time Specific Appointment Systems."*IIOSR Journal of Dental and Medical Sciences (IOSR-JDMS),* 20(03), 2021, pp. 14-27.