



Strategy for Improving the Effectiveness of Appointment System in Yariman Bakura Specialist Hospital Gusau, Zamfara State

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ABSTRACT

Appointment system is a method use for effective clinic preparation in such a way that, every patient is giving a specific date and time in order to see their attending physicians. Appointment system encounter with a number of challenges such as queuing system causing a long waiting time as an inefficiency of healthcare delivery system. The study therefore investigated the Effectiveness of Appointment System (EAS) in Yariman Bakura Specialist Hospital Gusau, Zamfara State. Survey research design was adopted for the study. The population of this study was Health Information Management Personnel. A total enumeration was use for the study. A structured and validated checklist was used for data collection. Data were analyzed using descriptive and inferential statistics at 5% level of significance. Findings showed that effectiveness of the appointment system in Yariman Bakura Specialist are rated positive, but equipment used are to be considered for future improvement of appointment system at the hospital. The study concluded that human efforts and procedural efficiencies are rated positively, but equipment use, remain significantly weak and negative. The study recommends that, there is need for management and government to provide the hospital with adequate materials use for effective appointment system.

Keywords: Effectiveness; appointment; system; waiting time; services quality.

1.0 INTRODUCTION

Appointment system is systematic approaches use as a key for effective clinic preparation in the hospital in such a way that, every patient is giving a specific date and time in order to see his/ her attending physicians (Hribar *et al.*, 2017; Lee *et al.*, 2018). This system helps in managing patient waiting time and effective control of resources in the hospital (Kothiya, 2025; Ostadmohammadi *et al.*, 2025). Appointment system is a structured way of managing and organizing clinic for the benefits of patients and healthcare service providers. It involves process for text message for appointment reminders, rescheduling, and cancelling appointments incase for emergency patients. Effective appointment system consists of appointment booking platform, appointment calendar, appointment diary and other equipment's in the appointment process (Hylton *et al.*, 2012; Zhao *et al.*, 2017). The assessment of effectiveness of appointment system comprise of components that create a seamless flow of booking appointment process to which it plays a critical role in time management. It ensures that all appointments are accurately scheduled and attended in order to minimize the waste of patient time for the betterment of outcome of healthcare service and patient's satisfaction.

1.1 Concept of Appointment

Globally, Dellaert *et al.* (2015) and Lohlun *et al.* (2015), stated that assessment of the effectiveness of appointment systems in the hospital service operations is all about a smooth flow of patient care by redesigning their systems and adapting to the best practices which acts as a bridge between hospital and patients satisfaction, hence it is very important to have the idea of maximizing the utilization and turnover of the patients in the hospital so as to improve services quality, appointment system in healthcare delivery is the scheduling and managing patient visits to ensure efficient healthcare service delivery by minimizing long queue, waiting times and optimize the use of resources. Appointment systems are used by patient and healthcare service providers in order to manage access to healthcare services. Many factors affect the performance of appointment systems including arrival and service time variability, patient and provider's preferences, available information technology and the experience level of the scheduling of hospital staff.

White *et al.* (2011), stated that, patients' satisfaction has become a serious concerns in the healthcare facilities to which a number of initiatives have been introduced to enhance patients' satisfaction through well-designed

appointment system especially urgent/emergency which indicate that loss of appointment lead to delay in continuity of patient care by the clinician. Therefore, with such strategies in place, it is sometimes necessary to reschedule certain booked appointments for non-urgent services in order to take care of urgent demand.

Symey *et al.* (2013), stated that an effective patient appointment system is critical in hospitals to ensure effective and efficient service delivery in the healthcare sector. Yet in order to target efficient appointment, there is a need for appropriate management and quality evaluation of the system. Most patients complain about the time spent between walking into the hospital and being attended by hospital staff, especially doctors. And this calls for proper handling. The proposed mobile application for patient appointment scheduling is poised to effectively facilitate delivery of health services in the health facilities. Appointments over the mobile phone provides more benefits using text message. These include time saving as staff spends less time in attending patients compared to paper-based appointments where patients need to fill a lots of forms.

There is no waste of time in queues when a mobile application based patient appointment scheduling system is used. Furthermore, the automated appointment reminder in the mobile appointment scheduling system also saves time as hospital operators won't be required to call and send SMS to patients reminding them of their appointments. Mobile phone based appointment system allows for 24 hours convenient scheduling and patients can make appointments at any time compared to making appointments physically by showing up at hospitals, which can be done only during working hours. Masud *et al.* (2014), stated that appointment via paper-based system requires patients to be at the hospital, fill in registration forms and return them to the registration desk, and patients are then assigned to the desired healthcare service provider

Aenparast *et al.* (2013), narrated that use of mobile appointment scheduling can enhance hospital appointments as it will allow patients to make appointments before going to the healthcare facilities. Patients can be reminded of as well. The clinic can monitor patient's performance while on the provided treatment, and the patient can select desired date and time of appointment based on his/her wishes. Near field communication technology is a wireless communication that is used to transmit data at a short range of distance, approximately 10cm. The intelligent agent system was developed for appointment, where patients can register and make appointments through mobile devices and eliminate the registration desk staff. Smart technologies for mobile appointment have been developed where

patients use mobile and near field communication technology (NFC). Patients need to tap their NFC cards into NFC readers at the main entrance gate of the hospital, and once there is an information match, the other scheduling procedures follows. Ingepatient.com is an online appointment scheduling system where patients need to register or sign up online in order to make appointments. New patients are required to have email accounts at the initial stage of registration. Once registered, patients are required to fill appointment forms at their own pace without queuing.

Cayirli and Veral (2006), opined that there are many factors that affect appointment. Some examples include service time, ceremony, public holiday and appropriate level of information technology use as well as smooth-running call center for managing patient requests.

Appointments demonstrate a level of professionalism. Making appointments is a great way to stay organized and ensure that important tasks get done promptly. Appointments can also be beneficial for building relationships for instance when two parties make an appointment, it shows that they are both committed to the task at hand and that they are willing to work together to achieve a common goal. This can help to foster trust and understanding between the two parties, which can lead to a stronger and more productive relationship have learned that appointments are an important part of organizing and managing one's time, creating a sense of accountability and responsibility. Making appointments ensures that important tasks are completed on time especially healthcare delivery system.

Mohamoud and Mash (2020), opined that the quality of service delivery can be assessed by attention to the quality of patient center in the healthcare service, such as access to care and continuity of care. The relationship between patient and healthcare service providers are complex because other factors such as expectations play an important role to which the service quality in this era described the ways patient satisfaction is used as a yardstick to measure the quality of services provided in the hospitals, this means that every healthcare facilities have no option but to improve a greater market share in the growing competition in the hospitals environment so as to reduce patient queue in the hospital by creating a better appointment system.

In Nigeria, Yeo *et al.* (2014), described appointment system in many healthcare facilities as administrative responsibility of health information managers to ensures the smooth running of a system especially the government healthcare facilities. Traditionally, healthcare appointment system has considered doctor's time more valuable to that of the patients. This has been the belief

and practice in most Nigeria Government owned healthcare facilities where doctors do not keep to working time so much that they often go on break several times before the end of the day's shift for this assertion in some third world nation such as Ghana, Kenya and especially in North-West, Nigeria there were several factors that directly and indirectly affect appointment system such as strike, conference, ceremony and public holiday (Hribar et al., 2017; Lee et al., 2018). This old practice has led to patients long waiting time due to the increase in the doctors' idle time and inadequate queuing system in the hospitals. Modern development in appointment system has been focused on decisive time factors as regards patients and healthcare service providers so as to avoid patient waiting time.

Hence, patients waiting time can be greatly minimized with the use of mathematical model to evaluate the waiting time interval for patients and service providers. The need to develop a queuing system for hospital appointment booking is very necessary and profitable for healthcare delivery system to which will increase patient satisfaction as well as reducing the burden on service stress, this mean that, it depends on manual or electronic processes for selection of an appointment time for every patient (Cayirli et al., 2006; Cayirli et al., 2008).

The waiting time is a distance which a person certainly waits in sequence for a definite activity to commence for service requested or obligated. The waiting process is a state or an act of expecting or looking forward to service that is about to be received (Chen and Robinson, 2005). Usually, some patients' waits patiently for service while others are restless and intolerant of delays of service. Long waiting time of patients registered in urban health centers in developing country such as Nigeria is a serious issue, therefore, an appointment booking system lies at the intersection of providing efficient and timely access to healthcare services

1.2 Aim of the Study

Effective consultation, diagnosis and treatment of ailments could directly be linked to the accessibility of the patients to the health personnel. Specifically, appointment system plays a vital role in ensuring the level of accessibility of patients to health personnel and facilities. The study therefore primarily investigated the Effectiveness of Appointment System (EAS) in Yariman Bakura Specialist Hospital Gusau, Zamfara State. Survey research design was adopted for the study. The population of the study was Health Information Management Personnel.

2.0 METHODOLOGY

Survey research design was used for the conduct of this study, a sample of seventy copies of checklist were distributed and 63 were returned with 85 % response rate. The target population of this study was limited to Health Information Managers of Yariman Bakura Specialist Hospital Gusau, Zamfara State in North-West, Nigeria. Total enumeration was used for Health information management personnel in Yariman Bakura Specialist Hospital Gusau, Zamfara State in North-West, Nigeria. The instrument for data collection in this study area was check list tool, in order to identify the assessment of the effectiveness of appointment system. The checklist tool was verified and validated by the professional for the conduct of the research. To assess the internal consistency of the instrument used to measure the effectiveness of appointment systems Cronbach's Alpha was computed.

This test was conducted to evaluate the internal consistency of the items used to assess the effectiveness of the appointment system in Yariman Bakura Specialist Hospital, Gusau. The measuring aspects such as waiting time, queuing system, and service quality, the Cronbach's Alpha value is **0.86**. This value exceeds the minimum acceptable threshold of 0.70, indicating a **high level of internal consistency**. Thus, the items in this section are considered to reliably measure the effectiveness of the appointment system. In conclusion, the high reliability values affirm that the instrument is **statistically sound** for further analysis of the research objectives.

3.0 RESULTS AND DISCUSSION

To address the effectiveness of appointment system a composite score was calculated using all the items of the structured checklist tool, which assessed the respondents' perceptions of the effectiveness of the appointment system at Yariman Bakura Specialist Hospital, Gusau. A one-sample t-test was then conducted to determine whether the mean composite score significantly differed from the neutral benchmark value of 2.50 on the 4-point Likert scale used in the instrument. The benchmark (2.50) was chosen as a reference point to assess whether the perceived level of effectiveness was neutral, below average, or above average (see Table 1).

Table 1: One-Sample t-Test Result for the Effectiveness of Appointment System.

Statistic	Value
Sample Size (N)	63
Mean Composite Score	2.70
Standard Deviation	0.322
Standard Error of Mean	0.041
Test Value (Benchmark)	2.50
t-statistic (t)	4.839

Degrees of Freedom (df)	62
p-value (Sig. 2-tailed)	0.000
Mean Difference	0.196
95% CI (Lower – Upper)	0.115 – 0.278
Effect Size (Cohen's <i>d</i>)	0.61
Effect Size (Hedges' <i>g</i>)	0.60

The results of the one-sample t-test presented in Table 4.5 reveal that the mean composite score for the effectiveness of the appointment system is **2.70**, which is significantly higher than the benchmark value of **2.50** ($t = 4.839$, $p < 0.001$). This indicates that respondents generally perceive the appointment system at Yariman Bakura Specialist Hospital, Gusau, as effective. The **95% confidence interval** for the mean difference ranges from **0.115 to 0.278**, further confirming the statistical significance and practical relevance of the finding (Cox et al., 2018; Guc et al., 2023).

The effect size, as measured by **Cohen's *d* = 0.61**, indicates a **moderate effect**, suggesting that the difference between the observed mean and the neutral benchmark is not only statistically significant but also meaningful in practice. This implies that the hospital's appointment system, as perceived by respondents, performs above average in terms of timeliness, organization, and service delivery effectiveness.

These findings align with the overall aim of the study, which is to assess the effectiveness of appointment systems in Yariman Bakura Specialist Hospital, Gusau. The statistically significant positive perception indicates that the hospital has made commendable efforts in managing its appointment processes. However, the moderate nature of the effect also suggests room for further improvements, particularly in areas such as reducing waiting times, enhancing queuing systems, and improving communication with patients (Hylton et al., 2012; Zhao et al., 2017).

In summary, the appointment system at the hospital is perceived to be effective by respondents, as shown by the statistically significant and practically meaningful results of the composite score analysis. This result provides important feedback for hospital management and policymakers to sustain and enhance service delivery mechanisms within the outpatient system (Zhang and Ye, 2025).

4.0 CONCLUSION

This research conclude that respondents generally perceive the appointment system at Yariman Bakura Specialist Hospital, Gusau, as effective. They further confirming the statistical significance and practical relevance of the finding. The effect size, as measured by **Cohen's** indicates a **moderate effect**, suggesting that the difference between the observed mean and the neutral benchmark is not only statistically significant but also meaningful in practice. However, appointment equipment used are significantly negative.

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