Wireless Calling system in Ophthalmology Clinics in Saudi Arabia

Abdullah S AlQahtani[1] and Mohammed Aiman Halawani*[2]

[1]Department of Surgery, Division of Ophthalmology, National Guard Hospital, Jeddah, Saudi Arabia - King Saud bin Abdulaziz University for Health Sciences, Jeddah, Saudi Arabia

[2]Medical Intern, Umm Al-Qura University, College of Medicine, Makkah, Saudi Arabia

*Corresponding author: Abdullah S Alqahtani, MD,DES,DISSO& FEBO, Vitreoretinal, Uveitis & Ocular Oncologist, Head section of Opthalmology KAMC & Assistant Professor, King Saud bin Abdulaziz University for Health Sciences, Jeddah, Saudi Arabia

Tel: 00966568888496; E-mail: dr-a-saleh@hotmail.com

Abstract

Introduction: Digital technology is playing a significant role in healthcare systems. This novel technology is proved to have a significant clinical benefit in the diagnosis and management of different medical specialties. However, it is still unclear if digital technology can have a clinical impact when applied to the operational system of hospitals.

Objective: The goal of this study is to explore the significance of using one of the applications of digital technology, Wireless patient calling system in ophthalmology clinics, compared to conventional calling systems.

Methods: The study included two steps; the first step was using the traditional calling system on one random day in the ophthalmology clinic. The second step was applying the Wireless patient calling system in another day in the same clinic and observing the differences in nurse and patients number standing in front of the clinic reception during timeline every half hour. between the two days. 30 patients were present in the first day and 30 patients in the second day.

Results: The average number of patients required an equivalent average number of nurses in the conventional calling system. On the other hand, the average number of nurses required a similar number of patients was lower in the Wireless calling system day. Additionally, the average number of doctors required for the Wireless calling system was lower compared to the conventional calling system.

Conclusion: The Wireless patient calling system can have time and cost-saving benefits and save the workforce of healthcare professionals for more critical clinical duties.

Keywords: Technology; Healthcare systems; Calling systems; Patient care; Operational system

Introduction

In the past decade, advances in health information technology have made significant changes in daily medical practice all over the world [1]. The applications of digital technology in healthcare institutions ranged from electronic medical records, scheduling appointments, electronic prescriptions, and the use of medical scores for diagnosis and treatment [2]. All these applications showed a positive impact on the service provided [3].

The need for digital technologies became even more urgent with the global problem of medical staff shortage [4]. Physicians and nurses could become busier due to logistic considerations, which can negatively influence the direct medical care provided to patients [5]. Thanks to digital technologies, this saved time for healthcare staff, to dedicate more of their time and effort to patient care [6].

One of the time-consuming processes is patient calling in clinics [7]. Conventionally, a clinic may dedicate a healthcare member, usually a nurse, to call for patients in a clinic [8]. This represents a significant waste for a precious medical resource, who can otherwise provide medical care that cannot be offered by other means [9]. Instead, electronic patient calling systems can save nursing time and improve their practice [10].

In Europe and other developed countries, patients can book their medical appointments through an online system and sign in electronically upon arrival to the clinic [11]. Also, the Wireless patient calling system is used to inform patients about their turn, without unnecessary consumption of the medical workforce [12]. This practice has shown significant economic and clinical improvement in the service provided, as well as increased patients satisfaction [13].

Despite the use of health information technology applications in almost all hospitals in Saudi Arabia. The implications of this technology in operating outpatient clinics have not been studied [14]. Therefore, the goal of the present investigation is to compare the use of the Wireless patient calling system in an ophthalmology clinic in Saudi Arabia versus the use of a conventional calling system.

Materials and Methods

Study design

This is a cross-sectional, prospective study carried out in King Abdulaziz Medical City outpatient ophthalmology clinic in Saudi Arabia. 30 Adult patients were present in the wireless system and 30 patients were present in the conventional system. A conventional calling system that was operated through a nursing or administrative staff, who arranged patient's entrance personally, was used in one day, and a Wireless patient calling system was used in another day in the same clinic with the same medical staff. Both days were chosen randomly.

The wireless patient calling system is a ''Wireless Pager System Support'' that has a range of 600 meters in open areas, and 200 to 400 meters in closed areas with multiple walls. The device operates in three modes: vibration and led flash, buzzer and led flash, or vibration, buzzer and led flash. The device does not require any special setting up, as all the pagers are pre-installed, it also has a stable signal.

Data collection

All data were recorded in a pre-designed and validated excel sheet. The timing of sign in for each patient to the clinic was recorded in both patients calling systems. Also, the number of nurses who were on duty during the study was recorded. The number of patients and nurses was recorded every half an hour.

Statistical analyses

Data were represented in terms of frequencies and valid percentages for categorical variables. Data were further analyzed using IBM SPSS (Statistical Package for the Social Science; IBM Corp, Armonk, NY, USA) to perform all statistical calculations, version 26 for Microsoft Windows.

Ethical considerations

Institutional research ethics board approval was acquired from the Ethics committee before conducting any study procedure.

Results and Discussion

A total of 60 patients were included in this study. Thirty patients were present in the normal patient calling system day, another 30 patients were present in the Wireless patient calling system day. The study was carried out over four hours in both days including 11 and 14 patients in the wireless system and conventional system respectively, with two physicians and two nurses each day. The recording of patients and nurses numbers was done every half an hour.

Conventional patient calling system

Among the thirty patients who were included in the first day, the average number of patients attending the clinic every half hour was one (0-4), where 14 patients presented between 8.00 am to 12.00 pm.

Table 1: Descriptive data for patients and medical staff in the conventional patient calling system day.

Time	No. of patients	No. of Nurses
8:00 a.m.	2	2
8:30 a.m.	3	0
9:30 a.m.	4	2
8:00 a.m.	0	2
10:00 a.m.	1	2
10:30 a.m.	2	1
11:00 a.m.	0	2
11:30 a.m.	1	2
Noon.	1	1
Total	14	14
Mean (n)	(1.55)	(1.55)
Minimum	0	1
Maximum	5	2

Turning to the medical staff, the maximum number of nurses working in the clinic at an hour was two nurses. In contrast, the minimum number of nurses was zero nurses, with an average number of nurses of one nurse and a range of two all over the day.

Table 1 shows the frequencies and descriptive analysis for patients and nurses, in the conventional calling system day.

Wireless patient calling system

30 patients were included on the second day, were 11 patients were included from 8.00 am to 12.00 pm. The average number of patients attending half hourly was one (0-3).

Turning to the medical staff, the maximum number of nurses working in the clinic at a half hour was two nurses. In contrast, the minimum number of nurses was zero nurses, with an average number of nurses of one nurse and a range of two. It is worth to mention that the fractioned mean for nurses and patients standing and waiting was lower in the Wireless patient calling system compared to the conventional patient calling system.

Table 2 shows the frequencies and descriptive analysis for patients and nurses, in the wireless calling system day.

Table 2: Descriptive data for patients and medical staff in the Wireless patient calling system day.

Time	No. of patients	No. of Nurses
8:00 a.m.	0	1
8:30 a.m.	0	1
9.00 a.m.	1	0
9:30 a.m.	2	0
10:00 a.m.	3	1
10:30 a.m.	2	2
11:00 a.m.	2	1
11:30 a.m.	0	1
Noon.	0	1
Total	11	8
Mean (n)	1.22	0.9
Minimum	0	0
Maximum	3	2

Clinical Implication and Significance

Digital technology is offering a wide range of applications recently in medical practice. These applications showed significant clinical and economic outcomes [7]. One of these applications could be the use of Wireless for a patient calling in outpatient clinics, which could have a positive impact on patients and medical staff experienced in the daily practice [15].

The present study investigates the implications of using a Wireless patient calling system in an ophthalmology outpatient clinic in Saudi Arabia, compared to a conventional patient calling systems. The study showed that the average number of medical staff required to operate the clinic with a Wireless patient calling system was lower than the number of medical staff in the conventional calling system.

A Wireless patient calling system can have some advantages apart of avoiding mispronouncing names of the patients during calling in multinational institutes by non-native calling nurse It provides a calm and quiet environment for both patients and medical staff, which can improve the performance of the medical staff and increase the patients' satisfaction with the service provided.

Also, the Wireless system can save both time and money spent on operating the clinic, which can be achieved by reducing the number of medical staff required while using the Wireless patient calling system.

Additionally, a Wireless patient calling system is simple to use for both patients and nurses and is not limited by the size of the clinic. It can be used in up to 1000 meters clinic. All these benefits made the Wireless patient calling system widely acceptable by both patients and healthcare professionals.

On the other hand, the Wireless patient calling system has some disadvantages. When used for the first time, some patients may become confused and do not understand how they can use this new system.

Also, the Wireless device requires to be charged for one and a half hours every working day. The Wireless patient calling system performs better in open areas compared to closed areas due to physical barriers. Moreover, some nurses might forget using the device while they are busy with other clinical duties.

To our knowledge, this is the first study to investigate the use of the Wireless patient calling system versus the conventional patient calling system in Saudi Arabia. Some limitations cannot be ignored while interpreting the findings of this study. The sample size was small, which made it difficult to evaluate the statistical significance of the findings compared to the two groups. Also, the use of both systems in only one clinic could question the external validity of the present findings.

Conclusion

Wireless patient calling system in ophthalmology clinics can reduce the time and cost required to operate the clinic and avoiding mispronouncing names during calling in multinational institutes , in addition to improved patients and healthcare team satisfaction. Future studies with a larger sample size should be carried out to achieve the statistical significance of these findings.

Additionally, decision-makers should take into consideration the findings of the present study, as a smart and fast solution for the problem of medical staff shortage, not only in ophthalmology but also in other medical specialties.

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