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IMPROVED PATIENT SATISFACTION BY OPTIMIZING CALL BELL RESOLUTIONS PRACTICE IN CLINICAL SETTING: AN ACTION RESEARCH AT MEDICAL AND SURGICAL WARD, NATIONAL GUARD HOSPITAL AFFAIRS DAMMAM

^{i,*}Fatimah Talaqof, ^{i,ii}Nor Aroma Abu Bakar, ⁱEman Al Mostafa, ⁱAlaa Moustafa, ⁱAmal Alfuraih & ⁱMona Al Obidi

ⁱImam Abdulrahman Bin Faisal Hospital, National Guard Hospital Affairs Dammam, Saudi Arabia ⁱⁱOpen University Malysia, Kelana Jaya centre, Selangor, Malaysia

*Corresponding author. E-mail: <u>TalaqofF@mngha.med.sa</u>

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ABSTRACT

Optimizing an effective communication system is very important to provide quality care services to patients, especially during emergencies. Thus, a cross-sectional quantitative design study was conducted at NGHA Dammam starting from November 2019 until February 2020 with the aimed to examine the patient' satisfaction related to nurse call bell responsive system and the time nurse respond to call bell and the time nurse intervene to the patients' need at Medical and Surgical Ward. A pre-survey related to patient satisfaction regarding nurse call bell responsiveness was conducted within two weeks starting November 2019. A total of 4 items were tested on patients at the study location including i) The time the nurse responds to the call bell, ii) The nurse responds and intervenes the patient's needs, iii) Patient satisfaction related to patient's education about the call bell and iv) Patient satisfaction regarding the nurse call bell service. About n=34 nurses involve in pre-survey and n=110 nurses in post-survey. The pre-survey (Nov-19) analysis result showed that the majority of the nurses took less than 2 minutes to respond to the call bell from their patients (n=28; 82%), n=5 took about 3-5 minutes to respond and n=1 (3%) took more than 10 min responsive. However, about n=10 (29%) of them took between 3-5 minutes that the nurses took to intervene to patient's needs after attending the call bell. Whereas, post-survey analysis found that the majority of the nurses did intervene to patient's need < 2 min after responding to the call bell (n=78) (Dec-19), n=100 (Jan-20) and n=100 (Feb-20). It was also found that there are n=24 nurses intervene between 3-5 minutes (Dec-19), n=7 (Jan-20) and n=7 (Feb-20). While as many as n=3 that the nurse intervenes to patient's need in between 5-10 min (Jan-20) and n=3



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(Feb-20) and as many as n=8 nurses intervene to patient's need > 10min (Dec-19). The finding also revealed that majority of patients/relatives stated that they were satisfied with the call bell related education provided by the nurse (n=92) and also stated that they were satisfied with the nurse call bell responsive system service at the study location (n=86). This study proves that optimizing the system's responsive nurse call bell system as an effective communication approach has successfully increased patient satisfaction with the services provided in addition to contributing to the improvement of patient safety policies at the study location.

Introduction

A frequently overlooked security feature is the call bell. An emergency response system, also referred to as a call bell or nurse's bell, is intended to provide prompt assistance to hospital patients or residents of assisted living facilities in times of need (Stranz et al., 2022). The knowledge that assistance is only a click away is provided to patients and their families through this round-the-clock support service. In hospitals, assisted living facilities, and other healthcare settings, both wired and wireless nurse call bell systems are easily and rapidly implemented (Chadwick & Hearn, 2013; Wen et al., 2022). Nurse call systems, also known as call bells, are dependent on assistive technology and usually comprise a wearable device that may be touched to initiate an alert with a single click (Nicolas & Terry, 2015; Mordaunt, 2021). Similar to wearable call bell devices, alarm calls are activated with a pull cord and are recorded through a customized touch panel before being shown on the tiny touch panel display screen. Alarm calls occasionally can also be forwarded to pagers, smartphones, and other mobile devices so that a carer can respond right away (Montie et al., 2017; Montie et al., 2018).

The "Courtney Thorne nurse call bell system" is one of the many varieties of call bell systems available (DiFilippo, Huang & Chapman-Novakofski, 2018). It has built-in Bluetooth and Wi-Fi sensors that make connecting to mobile devices safe, quick, and simple. The system also raises alarms to make sure that every call is understandable and easy to respond to. In order to handle every emergency, some nurse call bell systems can also be upgraded to include a variety of accessories, including pressure mats, overhead lights, heart units that comply with HTM, pagers, and watch systems (Umaefulam et al., 2022; Nicolas & Terry, 2015; Pannunzio et al., 2024). These nurse call bell system accessories are all designed to provide the best care possible at all times and provide a prompt response to emergency calls from patients or residents (Tzeng, 2011; Ghazali et al., 2022).

One aspect of excellent customer service in guaranteeing adherence to patient safety standards and objectives is offering innovation to patients and their families. One innovation that is frequently linked to patient safety tactics used in clinics to guarantee patients receive highquality care is the call bell (Montie et al., 2018; Umaefulam et al., 2022; Wen et al., 2022). One of the



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goals of this nurse call is for the patient or a family member to signal to the healthcare provider, *"I need your help"* so that the provider can respond right away (Parker-Pope, 2011; Chadwick & Hearn, 2013). On the other hand, a number of unfavorable occurrences or incidents will result from this system's ineffectiveness.

Literature Review

In order to guarantee that nurses deliver high-quality care, patient satisfaction with nursing services is still a phenomenon. Patient safety goals, as declared by JCI (2017), can be implemented to achieve dependable, high-quality nursing care and services. There is also a claim that the "*nurse call bell system*", which is present in practically every hospital around the globe, is a byword for the problem of adhering to patient care guidelines in terms of "*patient safety*". Senti & LeMire (2011) claimed that the nurse call system has the ability to gather basic statistics such the number of calls and response time, based on the nursing activity centre, also corroborate this. As stated by Deitrick et al., (2006) and Pannunzio et al., (2024), an analysis of this data may provide insight into patient satisfaction and performance.

In addition, Brash, Barai & Bamford (2015) concur that inpatient care is predicated on the idea that patients can communicate their needs and concerns to medical providers. Consequently, the patient's *"lifeline"* is the call bell. In the event that this system fails, there may be communication gaps that put patients at risk for avoidable injury (Brash et al., 2015; Tzeng, 2011). According to a study by Brash et al., (2015), which evaluated call bell accessibility, only 52% of 40 patients were unable to use their call bell at any given time. This clarifies that *"patient safety concerns have increased as a result of the call bell system's failure in this study, particularly for those who are considered vulnerable due to physical disability or mental capacity issues"* (Hravnak et al., 2018; Mordaunt, 2021; Stranz et al., 2022). Therefore, universal staff accountability, patient empowerment, and raising nursing understanding should be proposed to lessen this issue.

By ensuring that all employees, including nurses and other healthcare professionals who work with patients at the clinical site, follow patient safety goals, quality customer satisfaction may be ensured (Roszell et al., 2009; Senti & LeMire, 2011). All patients, both acute and chronic, who undoubtedly feel pain and difficulties, can be accommodated at the hospital. Patients and their families may require the aid of physicians and nurses in their separate units under dire circumstances. All patient units include a *"call bell"* that patients and their families can use to get in touch with this rapid support (Duffy et al., 2005; Michard & Sessler, 2018; Mordaunt, 2021).

Furthermore, a nurse call system located in the hub of nursing activity may be able to gather fundamental information like call volume and response time, most hospitals' present clinical environments (Roszell et al., 2009; Galinato et al., 2015; Hravnak et al., 2017). Examining this data could provide insight into patient happiness and performance. Thus, in order to comply with the World Health Organization's standards regarding patient safety goals, this quality improvement project was carried out to improve patient satisfaction by optimizing the call bell resolution practice in the Medical and Surgical Ward of the chosen study hospital.



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Case Report

There are fifteen (15) beds provided in the Female Medical and Surgical Ward to accommodate patients with various histories of acute and chronic medical illnesses and patients for surgery. However, on 30 September 2019 received a complaints from patient's spouse that they had to wait excessively long before their call bell was attended to. The patient is an antenatal mother; 37 weeks of pregnancy admitted to the maternity unit with signs and symptoms of labor for examination and further care management.

The patient's room is a Labor and Delivery Room, but due to design setup, the call bell is situated in the Female Medical Ward. Status quo analysis revealed no policy/guidelines on call bell responses and resolutions and what should be considered as best practice for call bell answering remained subjective to each nurse's own notions. This problem highlighted an issue which might be wider than only the particular room under discussion. A quick patient satisfaction poll on timeliness of call bell responses was conducted by the unit's Nurse Manager within two weeks.

Research Methodology

Immediately after receiving the complaint from the client, a survey related to patient satisfaction regarding nurse call bell responsiveness was conducted within two weeks starting November 2019. A total of 5 items were tested on patients at the study location (Refer Table 1). The data collected is in four aspects including i) The time the nurse responds to the call bell, ii) The nurse responds and intervenes the patient's needs, iii) Patient satisfaction related to patient's education about the call bell and iv) Patient satisfaction regarding the nurse call bell service.

Table 1: Survey form on survey related to patient's satisfaction regarding nurse call bell responsiveness

Survey Questioners	Excellent	Very good	Average	Poor
1. Did the Nurse educate you about the call bell system				
and its function?				
2. What is the time that the nurse takes usually to respond to your call bell?	<2	5-3	5-10	>10
3. What is the time that the nurse takes to intervene to your needs after she attended the call bell?	<2	5-3	5-10	>10
4. Are the nurses performing 2 hourly rounding to review your needs?				
5. Are you satisfied about the nurse call bell service?				

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Figure 1: The results of a preliminary survey related to the time nurse respond to call bell and the time nurse intervene to patient's need

Prior to the preliminary survey related to patient satisfaction, poor staff responsiveness to the call bell was identified as root-cause analysis. Later the average time needed by the staff to attend the call based on the unit design, and new targeted average time to attend the call bell was defined. Therefore, the time frame to implement the strategy has been set for two weeks to investigate the duration of time to answer the call bell by nurses at the study location. There were, five random call bell answering by nurses per day were recorded during working hours from Sunday to Thursday for two weeks. Therefore, a total of 34 call bell were made by the patient in two weeks. The estimation time set to measure the time responsive to the call bells was 2.5 minutes.

Figure 2 is preliminary survey results regarding the duration of time for nurses to respond to bell calls from patients whereby, majority of the nurses took less than 2 minutes to respond the call bell from their patients (n=28; 82%), n=5 took about 3-5 min respond and n=1 (3%) took more than 10 min responsive. However, about n=10 (29%) of them took in between 3-5 min that he nurses took to intervene to patient's needs after attended the call bell. However, this random survey did not cover call bell's reason resolution time. The quality improvement project is aiming at exploring and ensuring optimal practices around call bell answering and resolutions.







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Figure 3: The results of a preliminary survey related to patient satisfaction regarding nurse call bell services (November 2019)

A preliminary study was conducted to review the level of patient satisfaction related to call bell services before the implementation of the project. There are five items using dual language (Arabic and English) regarding the call bell service at the study location were tested. The results of the analysis found that a total of n=28 (82%) of the 34 patients and relatively stated that they were very satisfied with the service. Meanwhile, as many as n=4 (12%) felt it was normal and the rest stated they were not satisfied (n=2; 6%) with the nurse call bell service at the study location.

The results of the analysis showed that the percentage of patient dissatisfaction with this issue was proven when it was found that n=6 out of 34 patients who made a request through the call bell, received a response from the nurse >3 min as shown in Figure 2. This poll revealed that it might not be the timeliness of the responses that causes most of the patients' dissatisfaction, but once the call bell has been attended to, there seems to be a long waiting time to get the reason for the call resolved. Deep diving on the *"time of call's complete resolution"* revealed that the delay might be linked to reason for call, e.g. pain vs. wanting to go to bathroom.

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Data Collection Process



Figure 4: Study Framework

Realizing the importance of improving the quality of patient management services, the ward management at the study location has planned a project to carry out an intervention aimed at increasing patient satisfaction by improving the existing call bell system. This project took three months starting from December 2019 until February 2020 as shown in Figure 5 with specific target as to decrease the time of responding to the call bell >2minutes and achieve 90% patient satisfaction related to the call bell service.

Results

The collected data was analyzed manually and using excel software to obtain the frequency and percentage for four variables namely the time nurse respond to call bell, the time nurse intervene to patient's need, patient satisfaction regarding patient's education and patient satisfaction regarding nurse call bell services. The result was presented in bar chart and pie chart as below.

Figure 5 above is the result of the analysis related to the time the nurse responds to the call bell after the treatment has been carried out. Data was collected for three months starting December 2019 until February 2020. The sample taken was N=110 call bells made by patients randomly every month. The analysis found that the majority responded < 2 min to the call bell



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from the patient/relative. However, many n=9 (Dec-19), n=10 (Jan-20) and n=10 (Feb-20). It was also found that there were n=1 calls that received a response from the nurse between 5-10 minutes in January 2020 and n=1 call in February 2020.







Figure 6: The results of a post intervention survey related to the time nurse intervene to patient's need (Dec2019-Feb2020) (N=110)

Meanwhile, Figure 6 above is the result of the analysis related to the time the nurse intervenes to the patient's need after the treatment is carried out. Data was collected for three months from December 2019 to February 2020. The sample taken is from N=110 call bells that have been done by patients randomly every month to analyze the time nurse intervenes to patient's need. The analysis found that the majority of the nurses did intervene to patient's need < 2 min after responding to the call bell (n=78) (Dec-19), n=100 (Jan-20) and n=100 (Feb-20). It was also found that there are n=24 nurses intervene between 3-5 minutes (Dec-19), n=7 (Jan-20) and n=7 (Feb-20). While as many as n=3 that the nurse intervenes to patient's need in between 5-10 min (Jan-20) and n=3 (Feb-20). The analysis also shows as many as n=8 nurses intervene to patient's need > 10min (Dec-19).



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Figure 8: The results of a post intervention survey related to patient satisfaction regarding nurse call bell services (Dec 2019 to Feb 2020)

Figure 7 and figure 8 show that the majority of patients/relatives stated that they were satisfied with the call bell related education provided by the nurse (n=92) and also stated that they were satisfied with the nurse call bell service at the study location (n=86).

Discussions

Nurse call is precisely what it sounds like, a system intended to let patients get in touch with their nurse or nursing station by phone. Nurses and patients can communicate quickly and easily with one other. Additionally, it may be a patient's only hope. TV controls and bed exit alarms are examples of things that can be linked with nurse call systems. The ability to link medical devices to the nurse call system via a wall station, such as IV pumps or ventilators, is a fantastic feature of contemporary nurse call systems (Yu et al., 2021). This makes it possible for the nurse's station to get warnings when connected medical equipment sounds an alarm (Balaguera et al., 2017). The advantage is that the alert can be addressed in advance, saving the nurse time and noise.



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In addition to needing assistance to walk, move, use the restroom, and for other necessities that call for immediate assistance from the patient or the patient's family, emergency scenarios involving the call bell system include code blue, bleeding, shortness of breath, and similar conditions. The claim that call bells, often referred to as call lights, are typical in inpatient healthcare institutions across the nation was also made by Wen et al., (2022). While the usage of call lights has a direct impact on nurse care delivery, there are still large gaps in research and technology that could have an impact on patient happiness and care quality. As stated by Roszell et al., (2009) and Parker-Pope (2011), nurses can manage patient requests and give prompt aid to individuals in need even with the support of the patient care system. When handling alarms, nurses must overcome a number of challenges.

This demonstrates emphatically how crucial call bell services are to offering the best and quickest care services possible in accordance with patient needs. As a matter of fact, this study highlights the significance of educating patients and their families about this call bell service so that they can promptly direct assistance to nurses in case the patient requires emergency care. This is demonstrated by the fact that the majority of study participants expressed satisfaction with the hospital's call bell service and the teaching they received from the nurses about how to utilize the call bell while in the ward. In addition, it was observed that the majority of nurses answered the patient's bell call in less than five minutes, and that the nurses intervened on the patient's behalf in less than five minutes, as stipulated by the hospital policy.

Nonetheless, wall stations, bedside cables, desk consoles, code blue, and pillow speakers also referred to as call lights are the three primary parts of a nurse call system in the modern world. This system is highly helpful for the hospital as well as for the general public because it serves as a channel of communication for patients' and families' needs as well as for nurses' and physicians'. This call bell system is ideal for usage in hospitals or at home in case of an emergency. During their hospital stay, about eighteen patients who were selected for the study took part in one-on-one semi-structured interviews. The study's findings highlighted issues related to usability, improved communication, and recommendations for enhancing the design of the alpha prototype. Following usage and feature demonstrations, Eloquence was deemed by participating nurses and patients to be a welcome addition to nurse call technology, with the potential to enhance workflow and patient outcomes.

Eventually, the study by Wen et al., (2022) sought to present the experience and application of a cutting-edge smart patient care system (SPCS). 82 nurses in all, 25 from wards that have implemented SPCS and 57 from wards that employ the conventional patient care system (TPCS) are employed by Taiwanese Medical Centre. The primary benefits of SPCS over TPCS include the ability to specify the destination of the alarm, route the alarm directly to a mobile device, provide quick phone communication, and have a three-stage bed escape alert with a low false alarm rate. The findings showed that 32% of nurses in SPCS wards and 56% of nurses in TPCS wards, respectively, thought that bed escape warnings were readily disregarded.



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As a result, the Wen et al., (2022) study discovered that 30.91% of alarms utilizing SPCS were handled because nurses used mobile phones to receive and provide feedback. Researchers came to the conclusion that intelligent patient care technologies are necessary to support nurses in prioritizing jobs over responding to alerts and, eventually, to help them adjust their work in different scenarios to enhance labour efficiency and care quality.

Conclusion

This study proves that optimizing the system's responsive nurse call bell system as an effective communication approach has successfully increased patient satisfaction with the services provided in addition to contributing to the improvement of patient safety policies at the study location. In relation to the finding result, it is clear that nurse call bell services are very important in ensuring that the best services can be provided to patients, especially in times of need when in an emergency situation. The results of the analysis also show the educational services related to the call bell system provided by the hospital to ensure the best patient care and management can be provided.

Therefore, a survey of the level of patient satisfaction with the call bell service provided should not be underestimated. This can not only improve the quality of services to patients but also improve the level of patient safety in the clinic and prevent any unwanted complications by reducing the rate of incident statistics in the clinical area which is often discussed today.

This study has indirectly contributed to the addition of better knowledge of patient care and also the improvement of a stronger patient care policy regarding patient safety. This study also suggests that further studies can be extended related to the improvement of more sophisticated nurse call bell system services for patients in all categories including children, critical patients, mental patients, elderly patients and others such as advance technology remote continuous monitoring that might be helpful to early diagnose for patient in critical area including intensive care unit and Emergency Unit.

Following the findings of this study, the researcher intends to carry out further research projects related to the level of patient satisfaction and the level of nurse compliance with the policy and nurse call bell system that has been established in the BestCare System in clinical areas or other units such as pediatric wards, emergency departments and intensive critical units as a continuation of the research findings obtained from this study as an effort to help improve hospital management in relation to customer service as well as maintain the best healthcare services for patients in the study location.

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