



Perception of Nurses and Non-Physician Anaesthetists on Factors Associated with Perioperative Surgical Delay in Elective Surgeries at Kigali Referral Hospitals, Rwanda

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Surgical delay is defined as patient placement in the operating theatre later than the scheduled time. Literature point out that surgical delays is significantly contributing factor to poor patient outcomes and higher rate of hospital mortality.

The objective of the study were: to describe the perception of nurses and anesthetist on surgical delay in surgical discipline in elective surgery at Kigali referral hospitals and the perception of nurses and non-physician anesthetist on factors associated with surgical delay related to the hospital in elective surgeries at Kigali Referral Hospitals.

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Methods: A cross-sectional descriptive study was conducted at Kigali referral hospitals. The study population was the nurses and non-physician anesthetists working in theatre at Kigali referral hospitals, Rwanda. A convenience sampling method was used. A sample size of 140 nurses and anesthetists were included in the study. A self-administered questionnaire was used to collect data and were analyzed using SPSS version. The results were presented using table and figures.

Results: The surgical discipline delays was orthopedic, Neuro-surgery and laparoscopic surgery. The prominent contributing factors of surgery delay, the patient's delay to attend the hospital, instability of patients for operation, uncontrolled co-morbidities, and blood not booked on time.

Conclusion: The surgical delay was found in different discipline of surgeries, the associated factors were that related to patients, related to the caregivers and to the institution.

Recommendation: There is need to conduct further research to explore the in-depth effects of factors associated with surgical delay. In addition, there is need to stream line policies and procedure of patient pre-surgical reviews, preparations, scheduling and management of patients' flow in theatre to maximize on time.

Keywords: Perioperative; perception; factors; surgical delay; elective surgeries.

1. INTRODUCTION

The surgical delay is defined as patient placement in the operating theatre later than the scheduled time [1]. The surgical delay was reported to be associated with reduced patient satisfaction, and poor patient outcome [2]. The surgical delay from surgical ward to the theatre is a challenge globally, a study done by Yamuragiye et al., in [3] found that the average time of neurosurgery delay from ward to the operating room took 93min (1hour 33 minutes) [3]. However the time taken by surgical preparation of general surgery within operating room which is estimated from patient entry to the theatre and the surgical incision was reported to range from 21 to 49 minutes [4]. Although, the surgical delay from surgical ward to operating room is a challenging problem in patient waiting for elective surgery, the situation become pure, when this delay results into the surgical cancelation. A similar study found that 25% of surgical delay from surgical ward to operating room resulted to surgical cancellation [4].

The prevalence of surgical delay from surgical ward to operating room in USA was reported to be 36% of patients scheduled for major surgery, the main reason of surgical delay were the unavailability of surgeon, anesthesia teams and the patient who missed the schedule. The surgical delay was reported to be associated with complications of surgical pathology, a study conducted in UK by Buck et al., in 2013 found that every hour of surgical delay from surgical ward to operating theatre was linked to an adjusted 2.4% reduced probability of postoperative recovery in patient undergoing surgery for perforated peptic ulcer [5]. A study

done by Daniel I. Mclsaac et al., in 2017 found that 18.6% of surgical cases were delay to enter to the operating room, the main reasons of surgical delay were unavailability of surgical team (surgeons, anesthetists or nurses), and busy operating at 18.6% of delayed cases [6].

The surgical delay was also reported in developing countries, a study done in Pakistan by Jawaid and Ami found that the most common cause of surgical delay in 36.3% of cases was the absence of surgical team [7]. Although, surgical delay is a challenge in developing country, this issue becomes more serious when the surgical cancellation ensues, a study done in Saudi Arabia by Amani and Omar in 2017, found that 53.4% of surgical delay resulted to cancellation, the main causes were uncontrolled patients co-morbidities (high blood pressure and pulmonary pathologies), absence or unprepared surgical equipment or materials, unprepared surgical team and absence of beds in ICU/PICU to receive the critical surgical cases [8,9].

The surgical delay from surgical ward to operating room was reported to affect the patient negatively as the time of surgical delay increases, the patient satisfaction decreases [9]. In sub-Saharan Africa, the surgical delay and even cancelation were reported, a study done in Nigeria reported that surgical delay is mainly resulted from cancellation of scheduled cases on the days of operation [10]. Another study done in Uganda found that the shortage of operating room has led to 33% of delayed surgeries whereas shortage of blood caused 30% of surgical delay among the patients undergoing elective major surgery, moreover the insufficiency of infrastructure, such as,

insufficiency of hospital's beds, laboratory services, and ICU, in addition the lack of well-trained, and motivated human resource or absence of medication and supplies were additional factors causing surgical delay[11]. The same study attributed to these delays were inefficient utilization of theatre time, mainly due to long turnaround times, causing lists over run and cancellation of cases, this is reported to associated with patient's dissatisfaction and impairs patient's outcome [11].

However, the delayed surgery can result from patient's inability to pay the required services and surgical materials and equipment because of financial limitations, this likely to be common in developing countries [11]. Even though much effort has been done to improve the healthcare services in Rwanda, still the surgical delay is a challenge to the quality of healthcare services offered to patients undergoing surgical operations, a study conducted in Rwanda, has reported that 97% of surgical cases started later than planned starting time, the reasons for this delay were very different [3]. Therefore, this current study sought to describe the perception of nurses and anesthetist on surgical delay in surgical discipline in elective surgery at Kigali referral hospital and the perception of nurses and non-physician anesthetist on factors associated with surgical delay related to the hospital in elective surgeries at Kigali Referral Hospital.

1.1 Rational of the Study

This study inform national healthcare policy makers in referral hospitals' administration in particular, to recognize the perception of nurses and anesthetist on factors associated with perioperative surgical delay therefore the decisions and actions can be taken to reduce the factors contributing to surgical delay.

2. METHODS

2.1 Study Setting and Data Collection

The study was descriptive cross-sectional study conducted at Kigali University Teaching hospital, King Faisal Hospital and Rwanda Military hospital. It utilized a questionnaire with three sections, the first was made of socio-demographic data, and the second was composed by the surgical discipline delay, then the third was composed of the factors contributing to surgical delay. The items of factors contributing to surgical delay was

measured on a 4-point Likert scale ranging from 4 to 1 (strongly disagree= 1, disagree=2, agree= 3, and strongly agree= 4). Non probability sampling technique using a convenience sampling strategy was used and a pilot study was conducted to assess the validity and reliability of this data collection tool.

2.2 Study Objectives

1. To identify perception of nurses and non-physician anesthetist on perioperative surgical delay in elective surgeries at Kigali referral hospitals.
2. To identify the perception of nurses and non-physician anesthetist on hospital related factors that contributing to perioperative surgical delay in elective surgeries at Kigali referral hospitals.

2.3 Inclusion and Exclusion Criteria

The inclusion criteria were made for all registered nurses and non-physician anesthetist who were working in operating room at KUTH, RMH and KFH. These referral hospital were selected due to that they a large number surgical cases and the exclusion criteria were made for all other theatre personnel. After receiving approval from institutional review board/ college of medicine and health science (IRB/CMHS). After this, the researcher applied for permission from ethical committees of KUTH, RMH, and KFH. Upon receipt of approval, the researcher met the unit managers of the theatre introduced himself and explained the purpose of study and ask permission and appointment to meet the participants who are working in theatre and non-physician anesthetists.

3. RESULTS

Data were entered in SPSS version 21. The analysis was comprised of descriptive.

3.1 Demographic Characteristics of Respondents

This section present a demographic characteristics of respondents working in operating theatre of KFH, KUTH and RMH. The characteristics of respondents included the Gender, Age, professional, qualifications, and experience. The 140 respondents participated in the study, more than half (51.6%) of respondents were female compared to 48.4%of male. Respondents participated in the survey with the

most respondents 'age ranged between 30 to 40 years (62.3%) and least in 50 years and above age group with 1.4%. Also, the educational background of respondents varies, it was indicated that 50.8 %, 47.1 %, 1.4% and 0.7% of the respondents were with A1, A0, Masters and A2 respectively. Furthermore, the majority of respondents worked as registered nurses (57.1%), and least (15.8%) were assistant clinical officer anesthetists. Fifty-four respondents equivalent to 38.6% have been working for the position in years ranging between 5-15 yrs. whereas 52 out of 140 equivalents to 37.1% have been working for their positions between 10 and 15 years. Only 22.2% and 2.1% of respondents had 15+ years and at most five years of experience respectively as presented in Tables 1.

3.2 Perceptions about Surgical Discipline Delay

Respondent perceptions about surgical discipline delay were measured using a scored four dimension like scale i.e. 4= strongly agree, 3= agree, 2=disagree, 1 strongly disagree. Strongly agreed and agreed scores translated as high perception while disagree and strongly disagree as low perception. Regarding surgical discipline, perception of delays in orthopedic surgery rated high among 57.9% respondents and low among 42.1%. In Urologic surgery, 62.1% of respondents supported the fact that those types of surgery do not delay at all while 78.6% of respondent has low perception regarding delays in gyneco-obtetric surgery. On other hand, 64.3% of respondents show the high perception of surgical delay in Neuro-surgery whereas 79.2% had low perception on surgical delay in Plastic surgery. In ENT surgery there was low perception of surgical delay among 77.9% respondents and 75.7% in maxillofacial surgery. 86.4% of respondents have high perception on statement that Ophthalmic surgery exhibits surgical delay but 71.4% of respondents have a high perception that Laparoscopic surgery exhibits surgical delay. In summary, according to the research findings the respondent present a high perception on surgical delay in orthopedic surgery, Neuro-surgery and Laparoscopic surgery as presented in Table 2.

3.3 Perception on Hospitals Factors Associated to Surgical Delay

Respondent perceptions about surgical discipline delay were measured using a scored four dimension like scale i.e. 4= strongly agree, 3=

agree, 2=disagree, 1 strongly disagree. Strongly agreed and agreed scores translated as high perception while disagree and strongly disagree as low perception. Table 3 shows the respondents' perception on hospital related factors contributing to surgical delay. Majority of respondents (84.1%) had high perception that absence of materials is a route cause of surgical delay. Respondent (69.4%) had a high perception regarding the statement indicating that surgical delay may result from patient transport problem. Respondent (79.6%) had low perception regarding patients' admission and surgical delay during public holiday. Respondents (72.3%) had high perception that patients 'health insurance company procedures contributed to surgical delay. Respondents (61.2%) reported low perception when relating patients' surgical appointment booking system in referral hospitals as a cause of surgical delay. Perception on hospitals factors associated to surgical delay.

4. DISCUSSION

This was quantitative cross-section study conducted in Kigali referral hospitals, Rwanda. The study was conducted on nurses and anesthetist working in the operating rooms. The total sample size was 140 respondents. The majority of respondents were female and most of the respondents were between 30 and 40 years old and regarding the level of education the majority were having A1 followed by A0. A similar result was found in a study conducted in tertiary hospital in Spanish where the majority of the respondent were female and their age were above 30 years old and the majority were having university degree [12,13]. And among the respondents the majority were registered nurses and most of the Respondents were working from 5 to 10 year, similar results was found in a study conducted in Australia where most of the respondent were having university degree and were registered in their councils [14,15].

4.1 Perceptions on Surgical Discipline Delay

Respondent perceptions about surgical discipline delay were measured using a scored four dimension like scale i.e. 4= strongly agree, 3= agree, 2=disagree, 1 strongly disagree. Strongly agreed and agreed scores translated as high perception while disagree and strongly disagree as low perception. The majority of the Respondents the delay of patient pending of

Table 1. Socio-demographic characteristics of respondents (n=140)

Background characteristics		Frequency	Percent, %
Gender	Female	63	51.6
	Male	77	48.4
Age category	Below 30 yrs.	3	2.1
	30-40 yrs.	87	62.3
	40-50 yrs.	48	34.3
	50 yrs. and above	2	1.4
Qualification	A2	1	0.7
	A1	71	50.8
	A0	66	47.1
	Masters	2	1.4
Experience	5 yrs. and less	3	2.1
	5-10 yrs.	54	38.6
	10-15 yrs.	52	37.1
	15yrs and above	31	22.2
professional	Registered Nurse	82	57.1
	Non-physician anesthetist	58	42.9

Table 2. Perception of nurses and non-physician anesthetist on the common of surgical discipline delay

Surgical disciplines	Low perception	High perception
	Frequency/ Percentage	Frequency/ Percentage
General surgery	86(61.5)	54(38.5%)
Orthopedic surgery	59(42.1%)	81 (57.9%)
Urologic surgery	87(62. 1%)	53(37.9%)
Gyneco-obstetric surgery	110(78.6%)	30(21.4%)
Neuro-surgery	50(35.7 %)	90(64. 3 %)
Plastic surgery	111(79.2 %)	29(20.8 %)
ENT surgery	109(77.9 %)	31 (22.1 %)
Maxillofacial surgery	106 (75.7)	34 (24.3 %)
Ophthalmic surgery	121 (86.4 %)	19 (13.6 %)
Laparoscopic surgery	40 (28.6%)	100(71.4%)

Table 3. Perception on hospitals factors associated to surgical delay

Factors related to the hospital	Low perception	High perception
	Frequency/percentage	Frequency /percentage
admission during public holiday	109 (79.6 %)	31 (20.4 %)
Long waiting list and lack of coordination	34 (22.4 %)	106 (77.6%)
Shortage of nursing staff	86 (66.3%)	54(33.7%)
Insurance company procedures	100(72.3%)	40(27.7%)
Administrative procedures	75(56.3%)	65(43.7%)
Appointment system	82(61.2%)	58(38.8%)
Absence of materials/ equipment	25 (16.5%)	115(84.1%)
Operating room not ready for operation	30(26.9%)	110 (73.1%)
Availability of beds in ICU, CCU, PICU and recovery1	35(22.5 %)	105(77.5 %)
Bed management system	44 (27.9%)	96(72.1%)
Favoritism	108(77.7%)	32(22.3 %)
Patient transport problem	46(30.6%)	94 (69.4 %)

general surgery discipline and most of them have high perception that patient pending of orthopedic surgery exhibits delay during

compared to other discipline of surgeries the above results was similar to that found in Uganda where orthopedic surgery was taking place in

delaying [16]. And most of the respondent mentioned that patient pending on urologic surgery do not delay and most of the Respondent have low perception about the delay of penitent pending on gynecologic surgery whereas the majority have high perception on delay in patients pending on neurosurgery.

Regarding plastic surgery most of the respondent reported low perception, and reported low perception delay in ENT as well as maxillofacial surgery and the majority have low perception on the statements saying ophthalmic surgery exhibit surgery delay while they have high perception on patient pending on laparoscopic surgery as study conducted in United states of America showed that most the delay in surgery was a results of miss identification of the patients [9].

4.2 Perception Factors Related to the Hospital

Regarding to perception factors related to the hospital, the results showed that the majority of the participants have high perception that the long waiting list and lack of coordination, absence of materials is a route cause of surgical delay and about almost all the participants have high perception that patients transport problem, unavailability of ICU /HDU and RR behaves as route cause of surgical delay. On other hand and the majority of the respondents have low perception regarding on admission during public holiday, insurance company procedures, and appointment system, low perception that mentioned factors are root causes of surgical delay in referral hospitals, similar results were found in a study conducted in Saudi Arabia mentioning that hospital capabilities, care givers, clinical factors and administration factors lie behind most of surgical delays [17].

5. CONCLUSIONS

In summary, according to the research findings, there were surgical delays in patient who were waiting for orthopedic surgery, Neuro-surgery and Laparoscopic surgery as surgical discipline. Regarding the contributing factors of surgery delay the majority of the respondent had high perception that the health care givers factors were responsible for surgical delay more than other factors, whereby the majority had high perception that blood not booked on time, surgeons not ready for operation, anesthetist and nurses not ready for surgical operation, lab check not done on time. According to patients factors, the majority they have high perception that patient delay to attend, instability of patients for

operation, uncontrolled co-morbidities, patients unable to pay on time cause surgical delay. For the hospital factors, the majority of respondent have high perception that operating room not ready for operation, bed management system, unavailability of ICU /HDU and RR and patient transport problem are the most cause of surgical delay according to the hospital factors. All above factors needs more attention in order to minimize frequency of surgical delays.

6. LIMITATION AND CHALLENGES

The limitations of this study was that all respondent were not available data collection and also the low rate of return of the completed questionnaires from the respondents because the registered nurse and anesthetist who were working in theatre reported that they were unable to complete the questionnaire despite a regular reminder.

7. RECOMMENDATIONS

The study settings should elaborate policy and procedure for handling the factors associated with surgical delays as many of them can be prevented and managed. Team work will be a key in perioperative coordination by improving communication between all concerned department and the patient which facilitate run out the patient surgery booking, Moreover it is vital to frame, develop and manage all surgical waiting list for easy access and control.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and No text-to-image generators have been used during writing or the editing of this manuscript.

CONSENT

As per international standards or university standards, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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