

“Evaluating Queue Management System Impact on Patient Flow and Satisfaction in the Musculoskeletal and Orthopaedics OPD”

Dissertation to



The IIHMR University, Jaipur

For the partial fulfillment for the award of the degree of
Master of Business Administration (MBA)

in

Hospital and Health Management

by

Mr. Utkarsh Arora

Under the Supervision and Guidance of

Dr. Sandesh Kumar Sharma

2023

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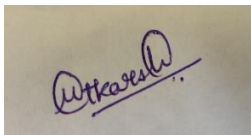
Under the Supervision of

Dr. Sandesh Kumar Sharma

2023

DECLARATION BY STUDENT

I hereby declare that this dissertation titled “**Evaluation of a Queue Management System for Improving Patient Flow and Satisfaction in the Musculoskeletal and Orthopaedics OPD**” is the bona fide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.



Utkarsh Arora

Date: 20th May 2023

CERTIFICATE



Date: 19-May-2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Utkarsh Arora** has completed his **internship** in the department of **Quality** from 20-Feb-2023 to 19-May-2023 with Global Health Ltd. (GHL) Medanta – The Medicity.

We wish his all the best for his future endeavors.

For GLOBAL HEALTH LTD

A handwritten signature in blue ink, appearing to read "Ashish", is written over the printed name.



Ashish Adhikari
Deputy General Manager – Human Resources



CERTIFICATE

This is to certify that dissertation titled “**Evaluation of a Queue Management System for Improving Patient Flow and Satisfaction in the Musculoskeletal and Orthopaedics OPD**” is a record of the research work undertaken by Mr. Utkarsh Arora in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and his approach to the research study has been sincere, scientific, and analytical.

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ABSTRACT

A prospective and retrospective study was conducted at a tertiary hospital in the outpatient department (OPD) for musculoskeletal and orthopedic conditions, the effect of a queue management system (QMS) on patient flow and satisfaction is assessed in this study. Long wait times, extremely long lines, and irrational motions between different OPD touchpoints are some of the issues that the deployment of a QMS intends to alleviate. Using a combination of methodologies, the study gathers information over a two-month period using both quantitative and qualitative methods. The waiting periods at various points in the patient's journey are quantified by time-motion analysis. To gauge patient happiness and experiences, qualitative data is gathered through a questionnaire survey. Following the adoption of the QMS, the results show reductions in the wait times for nursing assessments, consultations, and general waiting times.

According to patient feedback, both the billing service and the nursing experience have received very positive reviews. However, there are still certain things that may be done better, such separating the lines for pre-booked appointments from those for additional steps. The report makes suggestions for improving patient flow, optimizing consultation wait times, introducing distinct lines for scheduled appointments, offering ongoing staff training, and encouraging departmental cooperation. These suggestions are meant to improve patient satisfaction and patient flow in the MSK and orthopedics OPD. The study adds to the amount of knowledge already available on queue management in hospital settings and offers suggestions for enhancing patient care.

Keywords

Patient flow, patient satisfaction, musculoskeletal and orthopedics, outpatient department, Queue Management System.

ACKNOWLEDGEMENT

I want to convey my sincere gratitude to my mentor, Dr. Sandesh Kumar Sharma, whose advice, assistance, and knowledge have been crucial throughout the process of writing my dissertation. His kindness, wisdom, and support have been crucial in assisting me as I work through the obstacles presented by this undertaking.

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ABBREVIATIONS

OPD	Outpatient Department
QMS	Queue Management System
Avg	Average
MSK	Musculoskeletal
TMS	Time Motion Study
TM	Time Motion
TMA	Time Motion Analysis
OP	Outpatient
PT	Pre- test
PB	Post- test
NAW	Nursing Assessment Wait
CW	Consultation Wait
PFA	Patient Flow Analysis

“Evaluating Queue Management System Impact on Patient Flow and Satisfaction in the Musculoskeletal and Orthopaedics OPD”

Chapter 1: INTRODUCTION

In healthcare settings, managing patient flow and ensuring patient satisfaction are key priorities for healthcare providers. Patient dissatisfaction can be a result of lengthy wait times, unnecessarily long lines, and unnecessary transfers between touchpoints, which can affect the success of overall healthcare initiatives. The use of a Queue Management System has drawn attention as a practical means of overcoming these difficulties by optimizing patient flow and raising patient satisfaction. In the outpatient department for musculoskeletal and orthopedic conditions, this study intends to assess the effect of a QMS on patient flow and satisfaction.

1.1 BACKGROUND

The healthcare sector has seen a rising emphasis on enhancing patient flow and satisfaction inside outpatient departments in recent years. Offering diagnosis, treatment, and follow-up services, these departments are essential in providing specialized care to people.

High patient satisfaction rates and effective patient flow management are essential components of providing healthcare services. Managing patient flow can be particularly difficult at the MSK and orthopedics OPD, which offers specialized therapy for diseases involving the bones, joints, and muscles. Long wait times, congested waiting spaces, and ineffective procedures can all have a negative effect on the patient’s experience and make them dissatisfied.

Historically, healthcare institutions have operated on a first-come, first-served basis, which frequently leads to long lines and unpredictably long wait periods. This not only aggravates patients but also lowers the standard of treatment given in general.

Further aggravating the issue and squandering time for both patients and medical staff are unnecessary trips to other touchpoints inside the OPD, such as the billing desks, nursing assessment rooms, and consultation areas.

Healthcare facilities are increasingly turning to the adoption of QMS as a solution to these problems. A QMS is an all-encompassing strategy that combines several tactics and technology to optimize patient flow, cut down on wait times, and improve the patient experience. It includes features like appointment scheduling, effective triaging, digital queue displays, and simplified patient routing to the right locations inside the institution.

The effectiveness of a QMS must be carefully assessed in the context of the OPD for MSK and orthopedic conditions, though. Because this specialized OPD treats a particular patient population with needs and ailments, it needs specialized strategies to maximize patient flow. It is possible to get important insights into how to further improve patient flow management and raise patient satisfaction by conducting a thorough review of the QMS implementation in this environment.

1.2 AIMS and OBJECTIVES

The purpose of this study is to assess how a QMS affects patient satisfaction and flow in the MSK and orthopedics OPD. The study's particular objectives are as follows:

1. Assessing the differences in wait times before and after the QMS's installation for various patient journey phases, such as billing, nurse assessment, and consultation.
2. Evaluating the degree to which patients are satisfied with the QMS, nurse care, billing procedures, and overall experience in the orthopedic and MSK OPD.
3. Determining the degree to which issues like extremely lengthy queues, longer wait times, and pointless transfers between touchpoints have been handled by the QMS.

4. Identifying areas for improvement and making suggestions to increase patient satisfaction and patient flow in the orthopedic and MSK OPD.

Chapter 2: REVIEW OF LITERATURE

S. No.	Authors	Study Location	Sample Size	Sampling Technique	Salient Features
1	Farah Naaz, Idris Mohammed	AYUSH Hospital of Delhi	100 patients	Convenient sampling technique	• As a hospital's shop window and first point of contact with patients, the OPD is crucial. • Patient dissatisfaction is greatly impacted by overcrowding because of the lengthy wait times and short consultations. • To identify the gaps in the system, enhance it, and make healthcare more accessible to the public, this study looked into the services provided by AYUSH hospitals. • To determine the avg patient, wait time and the degree of patient satisfaction with the hospital's services, a time-motion study (TMS) was carried out.

					The OPD waiting time, consultation time, and pharmacy services received the least positive feedback from patients.
2	Jerry Levesque, Earl R. Bogoch, Barb Cooney, Brenda Johnston, James G. Wright	Wellesley Central site of St. Michael's Hospital, Toronto	<u>In phase 1:</u> 230 patients were taken from 5 clinics. <u>In phase 2:</u> 240 patients from 6 clinics. <u>In phase 3:</u> 255 patients from 7 clinics. <u>In phase 4:</u> 213 patients from 5 clinics.	NA	- Objective: To ascertain whether altering patients' expectations of the clinic visit and cutting down on the amount of time spent in the clinic can increase patient satisfaction. - Phase 1 calculated the total amount of clinic time needed for each patient type; phase 2 evaluated initial contentment; phase 3 changed the patients' anticipations; Phase 4 modified patient expectations and visit timing according to patient type. - Patient satisfaction with time spent in the clinic is the primary outcome indicator. - Changes in patient expectations and a

					reduction in the amount of time spent in the clinic can both increase patient satisfaction.
3	Ram Iswar Sah, Mrs.Rakhi Ahuja, Dhiraj Kumar Singh, Dr.Imran Ahmed, Dr.Mukesh Savaria	Delhi Pharmaceutical Sciences and Research University, New Delhi	NA	NA	- Any waiting a patient goes through before or during medical treatment is referred to as waiting for healthcare. - There are several different types of waiting for healthcare: waiting to make an appointment with a doctor, waiting in a waiting area before an appointment, and being monitored while under a doctor's careful waiting. - The management (administration) should focus on highlighting the hospital as one that offers "high-quality care with low waiting time" in order to ensure efficient workflow, effective functioning, and smooth operation of any OPDs.

4	Ali Bidari, Shabahang Jafarnejad, Nazanin Alaei Faradonbeh	Emergency Medicine Department , Iran University of Medical Sciences, Tehran, Iran	236 patients	Simple random sampling	• The study discovered that the emergency department's deployment of a queue management system greatly increased patient satisfaction. • Patients who utilized the queue management system said they felt more in control of their experience and better informed about how long they would have to wait. • The study also discovered that the amount of time patients had to wait to see a doctor was not significantly impacted by the implementation of a queue management system.
5	M.S. Burodo, S.Suleiman, Garba Yusuf	North- Western Nigeria	2850 patients	Simple random sampling	• According to the report, a sizable portion of patients were dissatisfied with how queues were handled at the chosen institutions. • Regression analysis demonstrated that the

					waiting time, waiting environment, and service quality were all significantly related to patient satisfaction. • The study suggests that to increase patient satisfaction, hospitals in North-Western Nigeria should enhance their queue management procedures.
6	E.S.Guarte, F.F.Elsayed, S.I.Khalil	OPD of 8 clinical clinics in Saudi German Hospital, Egypt.	40 nurses and 42 patients	Convenience sampling method	• PT and PB control group designs were employed in the study's quasi-experimental methodology. • According to the study, using a queue management system improved the standard of nursing service and patient satisfaction. • The study also indicated that nurses' knowledge, attitudes, and queue management practices improved when a queue management system was used.

7	Fatemeh Nouri, Mohammad Reza Rahnema, and Seyed Mohammad Reza Ghasemi	Iran	400 patients	Convenience sampling	• A queue management system considerably increased patient satisfaction with the waiting time, according to the study's findings. • The adoption of a queue management system, according to the study, has a favorable effect on patients' satisfaction with their entire healthcare experience. • The study's conclusions imply that using queue management systems can significantly raise patient satisfaction in healthcare facilities.
8	Lisasha Poudel, Swechhya Baskota, Prajita Mali, Priza Pradhananga, Nabina Malla, Bibek Rajbhandari, Susmita Nepal	Om Health Campus, Kathmandu , Nepal	94 OP	Convenience sampling	• To gauge patient satisfaction with OP services at a tertiary medical facility in Nepal, the study employed a cross-sectional approach. • Overall patient satisfaction was found to be quite high in the survey, with a mean score of 3.7394 out of

					5. • The communication (3.9628) and interpersonal behavior of health professionals (4.2872) categories received the highest satisfaction ratings. • Accessibility and convenience received the lowest satisfaction ratings (3.2394).
9	Mor Armony, Shlomo Israelit, Avishai Mandelbaum, Yariv N. Marmor, Yulia Tseytlin, and Galit B. Yom-Tov	A large Israeli hospital	1,000,000 patient visits	All patient visits to the hospital over a one-year period	• The study examined patient flow at a hospital from the perspective of queueing theory. • The study discovered that a queueing network can be used to predict patient flow in hospitals. • The number of patients coming to the hospital, the number of beds available, and the amount of time patients spend in each department were all elements that the study found to have an impact on patient flow.

					By detecting and resolving system bottlenecks, the study's findings can be leveraged to enhance patient flow in hospitals.
10	M. Kumar, J. Pillai	AIIMS, Bhubaneswar, India	150 patients	Simple random sampling	- A common questionnaire was employed in the study to gauge patient satisfaction with OPD services. - According to the survey, patients were generally satisfied with OPD services. - Patient satisfaction was highest in the categories of the doctor's conduct, cleanliness, and public utility services. - Waiting times and patient feedback systems scored lowest for patient satisfaction.
11	Poonam Kalne, A. Mehendale	NA	57 Studies	Systemic review	TMS are a sort of observational study that track people or groups of people as they do tasks to assess their

					time and motion. • TMSs have been utilized in the healthcare industry to investigate a range of issues, such as patient flow, employee productivity, and care quality. • TMS results can be used to boost healthcare delivery's effectiveness and efficiency.
12	Rahul Chopade, Nikhil Sharma, and Suresh Sundar	Rural health training centre attached to BKL Walawalka r rural medical college, Sawarde), district Ratnagiri, Maharashtra, India	300 patients	Convenience sampling	• The study was a cross-sectional investigation conducted from July to December of 2018 over a six-month period. • Patients who were above 18 years old weren't critically ill, and provided consent were included in the study. • Eighty instances on avg. were registered each day, including both new and old cases. Ten proforma can be filled out every day, according to pretesting.

					• 50.34% of study participants were satisfied with the total amount of time spent in the OPD, compared to 26% who were dissatisfied. • According to the study's findings, if more people are to be attracted to the hospital, patient satisfaction is the most crucial condition to be reached.
13	J. M. Corrigan, G. T. O'Connor, E. G. Campbell, E. S. Fisher	United States	NA	Convenience sample	• This study looked at how patient flow and satisfaction in OP clinics were affected by queue management technologies. • The study discovered that by decreasing wait times and raising customer satisfaction, queue management systems can enhance patient flow. • The study also discovered that queue management techniques can be

					successful in lowering patient tension and anxiety.
14	Catherine A. Dixon, David Punguyire, Michelle Mahabee-Gittens, Michael Ho, Chris J. Lindsell	Kintampo Municipal Hospital in Ghana	100 patients	Convenience sampling	• In settings with minimal resources, PFA is a straightforward approach for quality improvement that can be used to pinpoint patient flow trends. • According to the study, excessive wait times and high overall attendance rates were caused by staffing shortages and an imbalance between patient arrival spikes and staffing levels. • A median of 4.6 hours passed between arrival and the first provider contact. • The study's conclusions can guide changes in service delivery in environments with constrained resources.
15	Larissa Manning, Md. Shahidul Islam	Australia	24 Articles	Systematic search	• The study found five themes that were prevalent in regard to

					the difficulties in maintaining efficient patient flow in public hospitals. • The study concluded that improving patient flow in public hospitals requires a total system approach. • According to the study, more investigation is required to pinpoint actions that can be employed to get around obstacles to achieving an efficient patient flow.
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Chapter 3: METHODOLOGY

The method used to gather and analyze the data is thoroughly explained to the readers in this Chapter. It enables the reader to comprehend the sample techniques utilized, the population analyzed, the research design, and the data gathering, and analysis procedures used.

3.1 RESEARCH QUESTION

Does the introduction of a new QMS enhance patient flow and satisfaction in the MSK and orthopedics OPD?

3.2 RESEARCH DESIGN

It includes the general approach taken and the course of action chosen to address the study's goals and the research issue.

3.2.1 STUDY SETTING

The study was carried out at the Delhi/NCR region at Medanta- The Medicity Hospital, a multi-specialty facility with 1250 beds and roughly 40 specialties. The study, which took place in March and April of 2023, was directed by the hospital's head of the quality department.

3.2.2 RESEARCH APPROACHES

A prospective quantitative study design will be employed to evaluate the effect of a Queue Management System (QMS) on patient flow and satisfaction in the MSK and orthopedics OPD. A questionnaire survey and TMA will be used during the study. Patients who visited the musculoskeletal and orthopedics OPD during the study period would make up the participants. To choose individuals who meet the inclusion requirements, a practical sampling technique will be used. Based on

practicality and time availability, the sample size will be chosen.

3.2.3 DATA COLLECTION METHODS

- a) Time Motion Analysis: TMA will be used to calculate the length of various patient journey phases, such as billing, nursing evaluation, and consultation. The duration of each stage will be observed and recorded by trained researchers using a stopwatch. After the QMS was put in place, observations were made for a set amount of time. The TM data of 80 patients was observed as a sample (Pre and Post implementation). The TMA data will contain elements like the waiting times for billing, nurse assessments, consultations, and overall waiting times.
- b) Questionnaire Survey: Patients will be given a structured questionnaire to complete to gather information about their satisfaction and experiences. A variety of factors, including patient satisfaction with the QMS, nurse services, the billing procedure, and overall experience in the musculoskeletal and orthopedics OPD, will be evaluated using the questionnaire. The survey will include 1 open-ended questions for extra suggestions in addition to closed-ended questions with Likert scale responses. A total of 80 patients' responses were observed as a sample. Using both online and offline modes, the responses were collected in person.

3.2.4 DATA ANALYSIS

- a) Time Motion Analysis: For analysis, the TM information gathered through observations was entered into Excel. Each stage of the patient journey, including billing, nursing evaluation, and consultation, were given a mean, median, and range. To determine how the QMS has affected patient flow, pre- and post-implementation data was compared. Also, to determine the mean time for each phase and other important measurements for each parameter, descriptive statistics were employed. So, that the changes could be tracked.
- b) Questionnaire Survey Analysis: The data from the questionnaire survey was imported into Excel for analysis. Each question's replies were compiled using

descriptive statistics. Thematic analysis was also used to find recurring themes and patterns in the qualitative data collected from close-ended and open-ended questions that relate to patient satisfaction.

The methodology described above enables a thorough assessment of the QMS's effects on patient satisfaction and flow. TMA and questionnaires together provide both objective and subjective insights on the success of the improvements that have been performed. The data analysis procedure produced insightful information about the advancements made and supported the development of fact-based judgements.

3.2.5 PROCESS FLOW

To depict the steps in the OPD process, a process flow diagram was made.

PROCESS FLOW

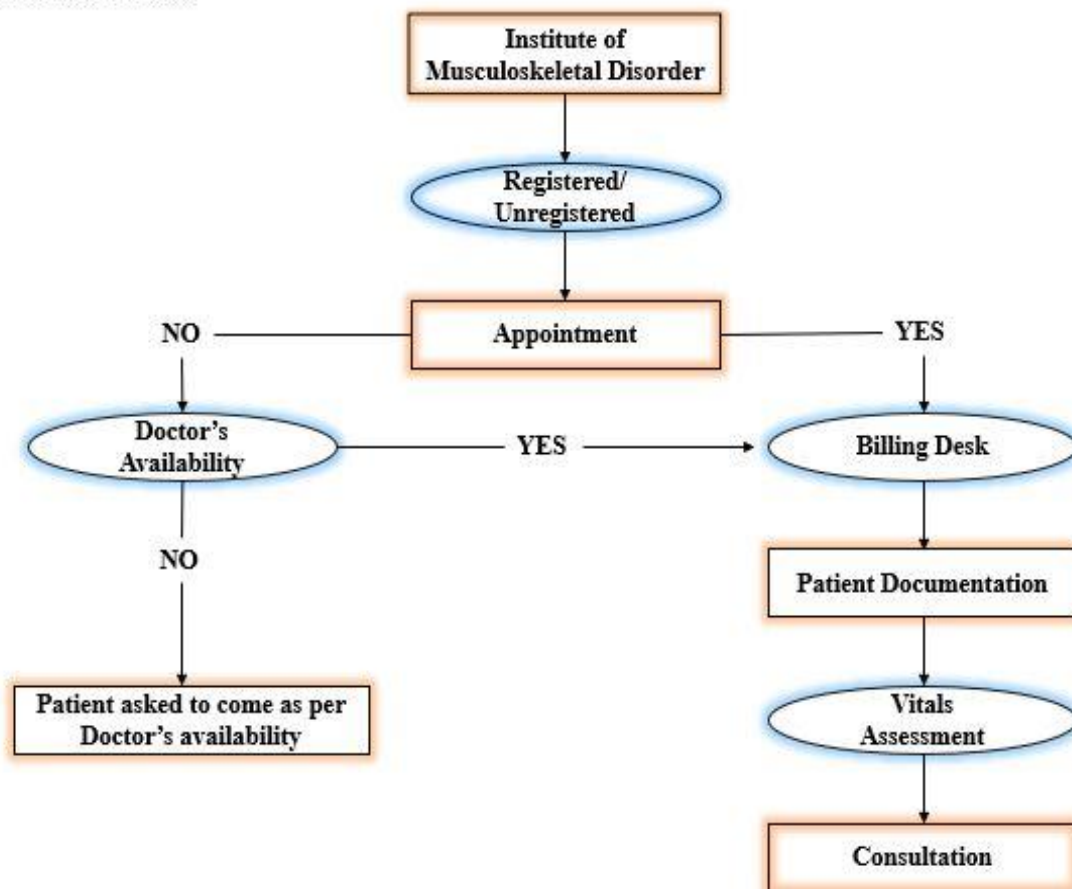


Figure 1: Process flow of musculoskeletal and orthopedics floor

3.2.6 ETHICAL CONSIDERATION

While conducting the research, the following ethical issues was considered:

- The study's objective, the participants' voluntary involvement, and the confidentiality of their data were all clearly disclosed to them before they gave their informed consent.
- Participant data were anonymous during data analysis and reporting to maintain participant privacy.
- The study was conducted with the utmost regard for participants' privacy and dignity, creating a welcoming and courteous environment for data gathering.
- The study was abided by all relevant laws, rules, and directives governing research, particularly those pertaining to data protection and the rights of human subjects.

Chapter 4: RESULTS

This section offers the readers an easy-to-understand description of the data that was gathered, examined, and interpreted to address the study questions.

OPD Consultation

- A day in the orthopedic and MSK specialty sees about 150 patients.
- The typical wait time for billing is 10 minutes between 10 AM to 12 PM and 2 PM to 5 PM i.e., the peak hours.
- 38% of patients are female, with the remaining patients being men.
- On this floor, nine doctors are scheduled for OPD.

Time Motion Analysis of Patients

According to the data, 46.5% of people had appointments, while the other 53.5% were walk-ins. Both before and after the QMS's introduction, this distribution was seen.

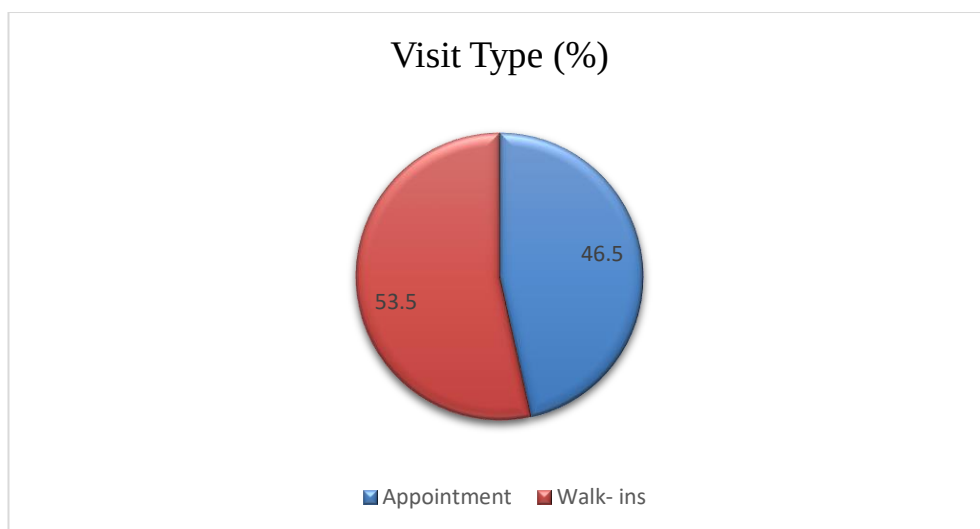


Figure 2: Patient visit type

According to the data, 77.5% of the patients were panel patients and the remaining 22.5% belonged to the cash group. Both before and after the QMS's introduction, this distribution was seen.

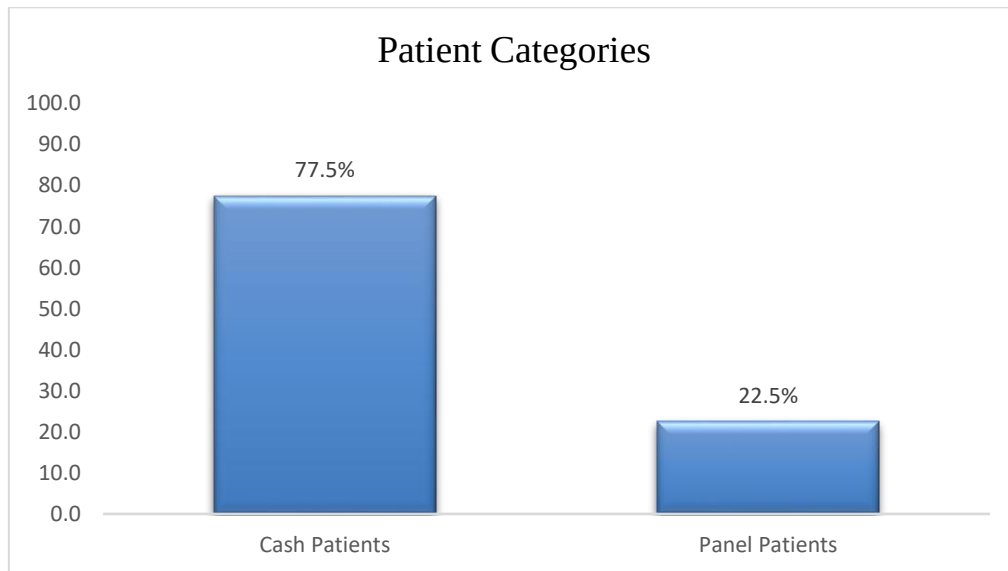


Figure 3: Visiting patient categories

The avg. billing time was 3.4 minutes prior to the deployment of the QMS and 3.5 minutes following its implementation, according to a review of pre- and post-QMS data.

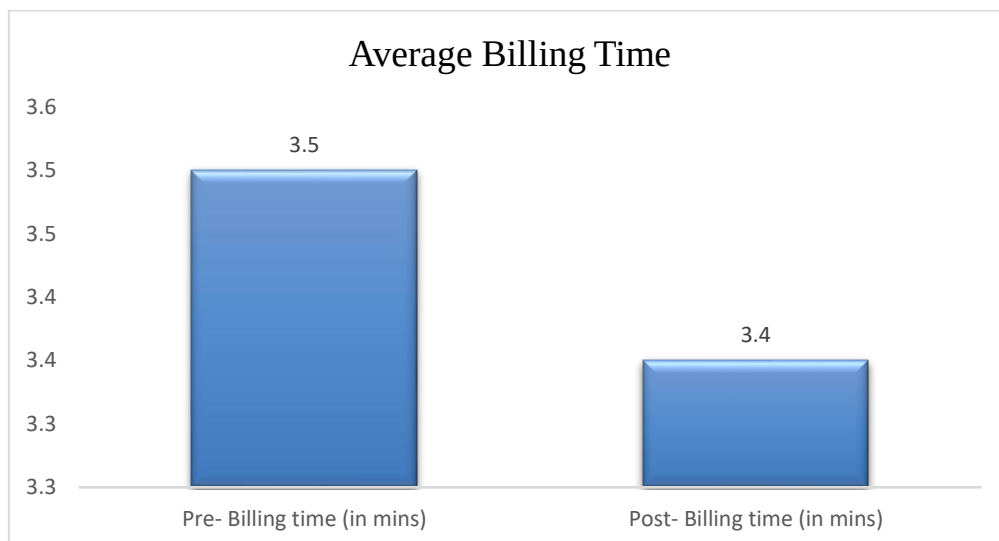


Figure 4: Avg. billing time before and after the QMS

The avg. NAW was 7.1 minutes prior to the introduction of the QMS. However, upon implementation, the typical wait time for a nursing assessment dropped to 4.8 minutes.

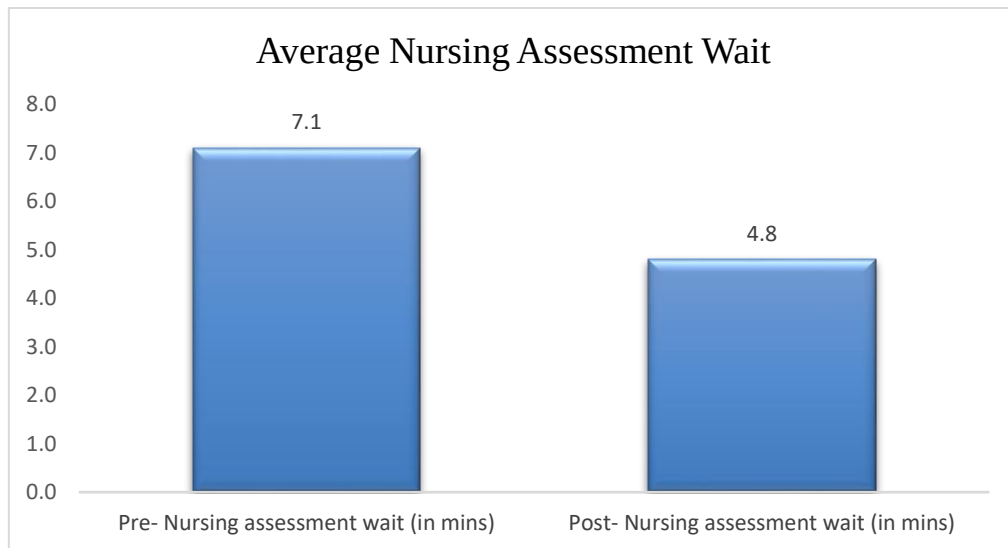


Figure 5: Avg. Nursing assessment wait before and after QMS

The avg. wait time at the nursing counter was 4.9 minutes prior to the introduction of the QMS which dropped to 2.8 minutes on average.

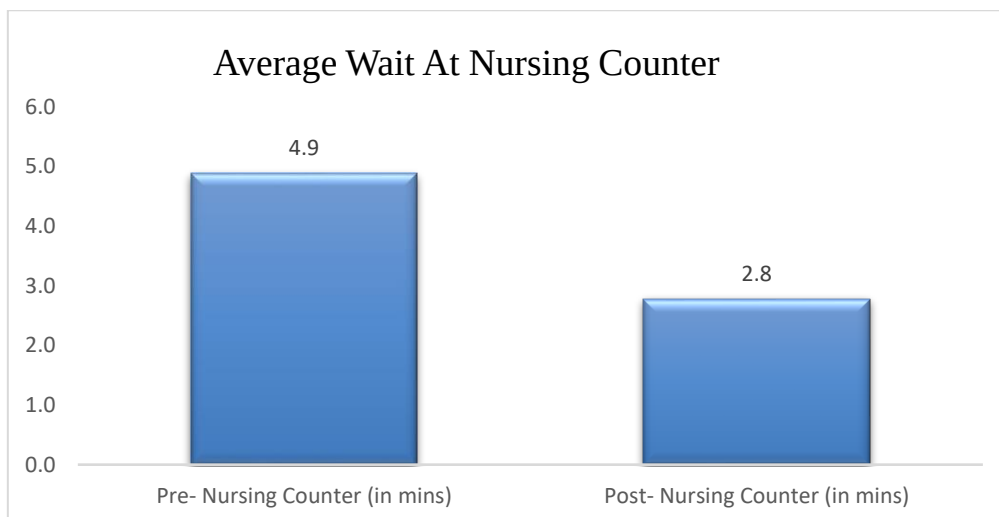


Figure 6: Avg. wait at nursing counter after the assessment

The average CW time was recorded to be 26.8 minutes prior to the introduction of the QMS which was reduced to 23.2 after the introduction.

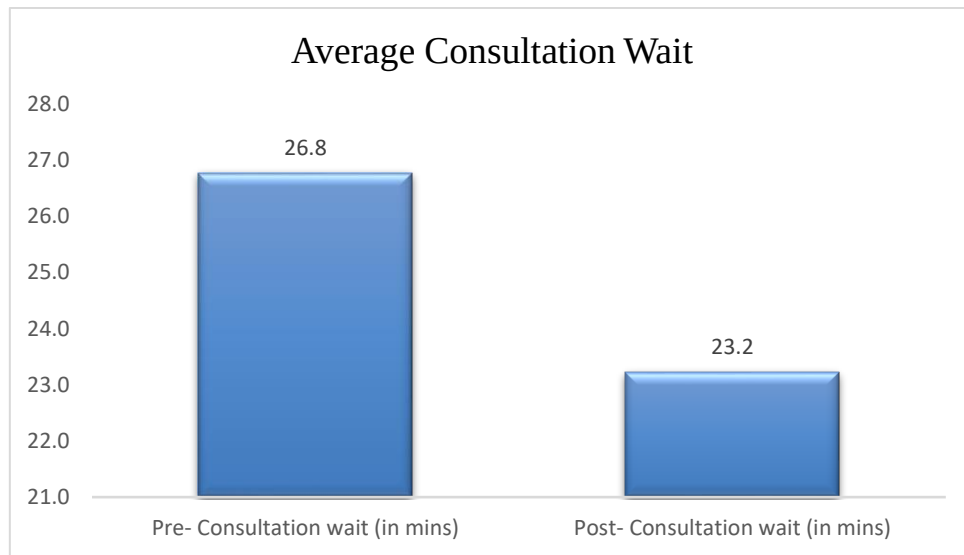


Figure 7: Avg. consultation wait before and after the QMS

During January to February 2023, it was observed that average waiting time was 40.2 minutes which fell to 32.0 minutes after the deployment i.e., in the next two months.

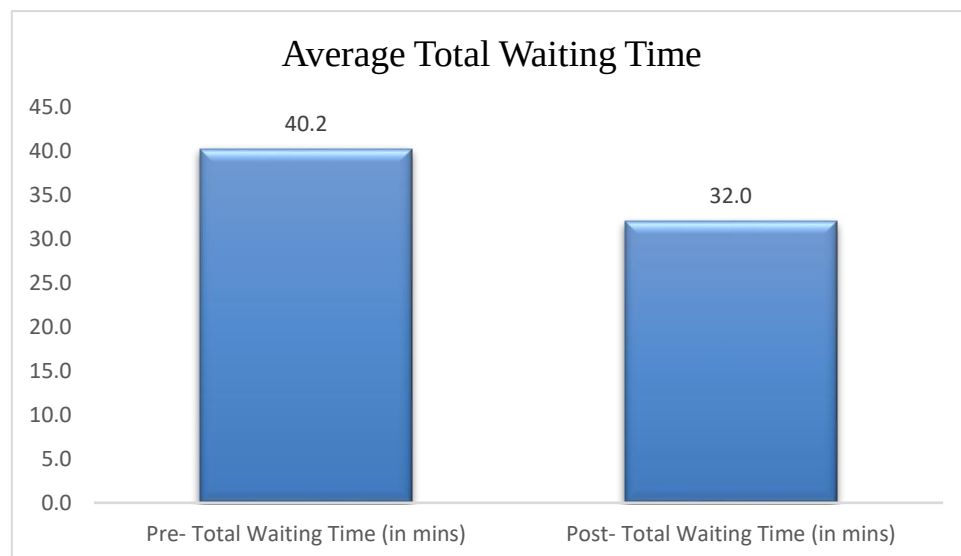


Figure 8: Avg. total waiting time pre and post QMS

70.6% of respondents were visiting the MSK and orthopedics OPD for the first time, with the remaining percentage having been there before.

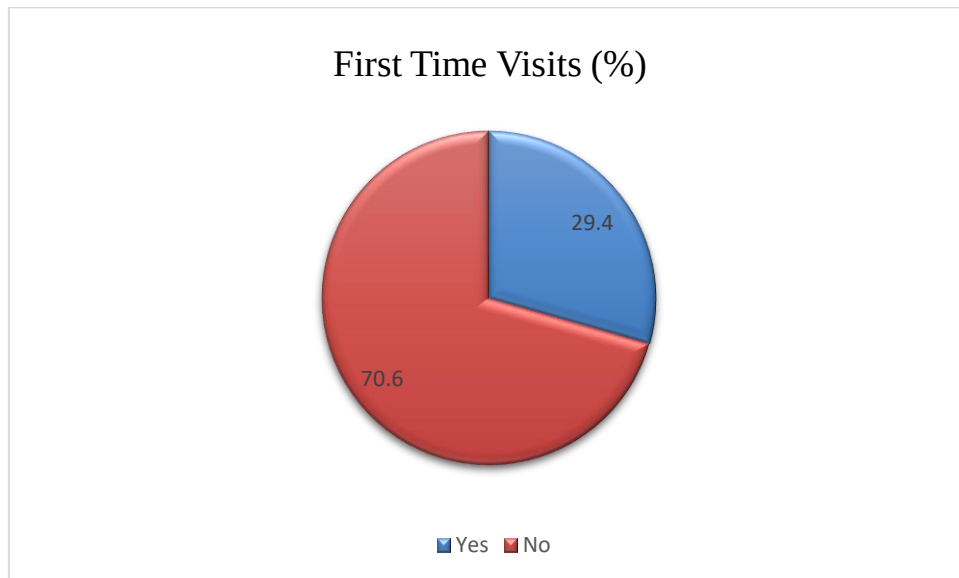


Figure 9: Respondents visiting for the first time

Patient Satisfaction Assessment:

A survey found that roughly 73% of patients were very satisfied with the billing service. However, only about 13% of patients thought the billing service was unsatisfactory.

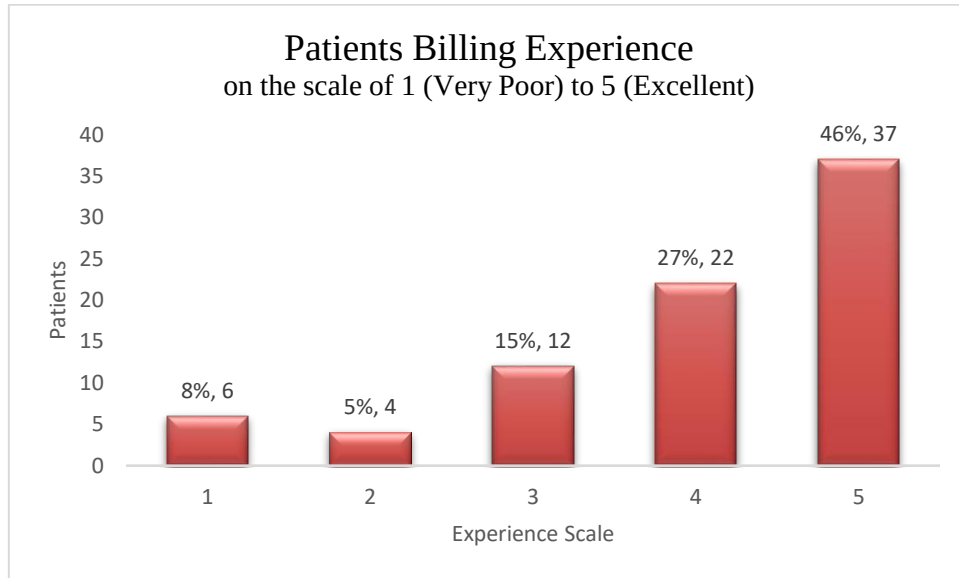


Figure 10: Respondents billing experience

At the OPD, 74.5% of patients took the nurse token, while the remaining proportion did not.

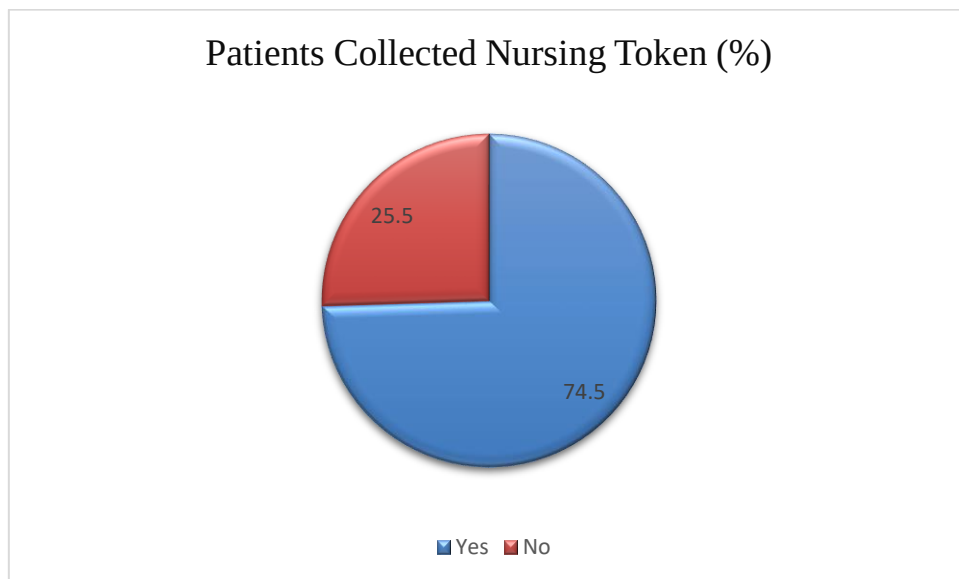


Figure 11: Percentage of collection of the nursing token

The billing staff advised about 63% of patients to pick up the nursing token at the OPD. However, about 29% of patients didn't receive assistance from the billing staff for the same.

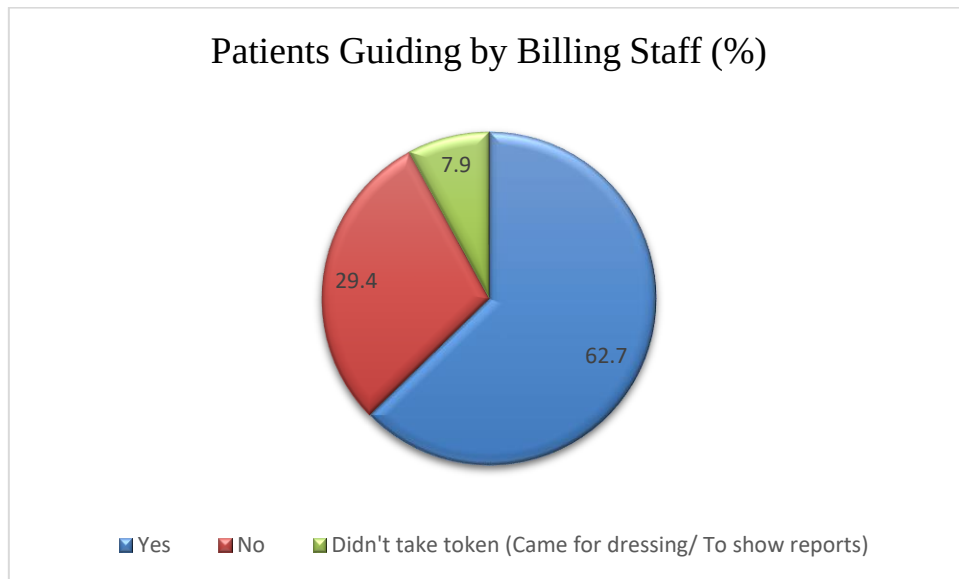


Figure 12: Percentage of guidance given by billing staff for token

The token system that was adopted at the OPD was supported by about 84% of patients.

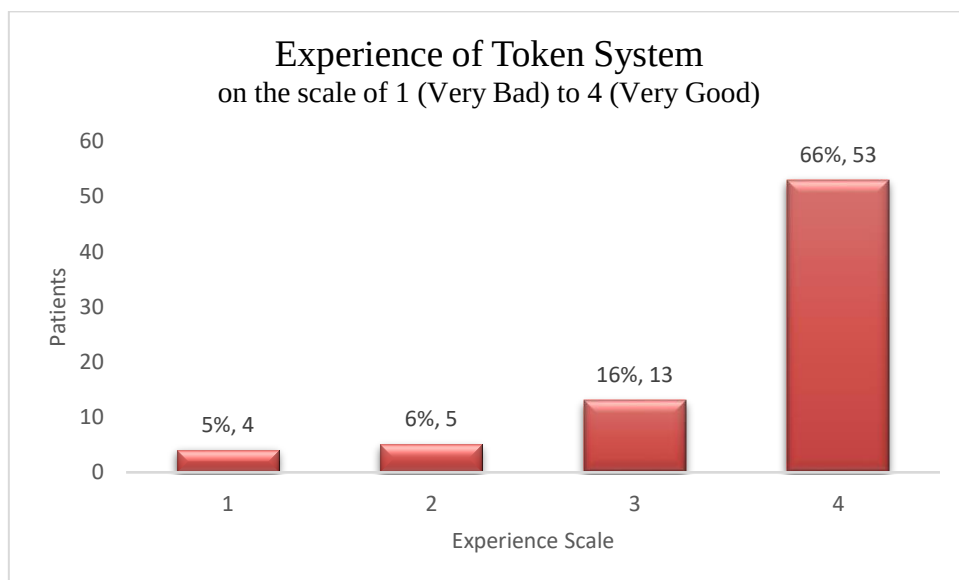


Figure 13: Experience of token system to get the vitals checked

The nurse evaluation room directed about 80% of patients to the nursing counter.

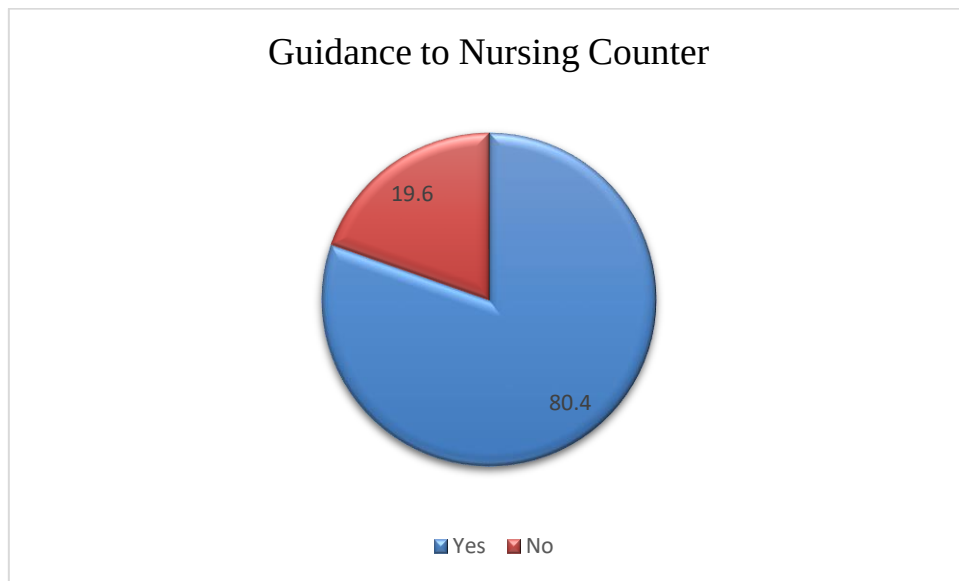


Figure 14: Percentage of patient guidance after assessment to nursing counter

About 90% of patients received direction and attention from the nursing personnel when it was their turn for consultation.

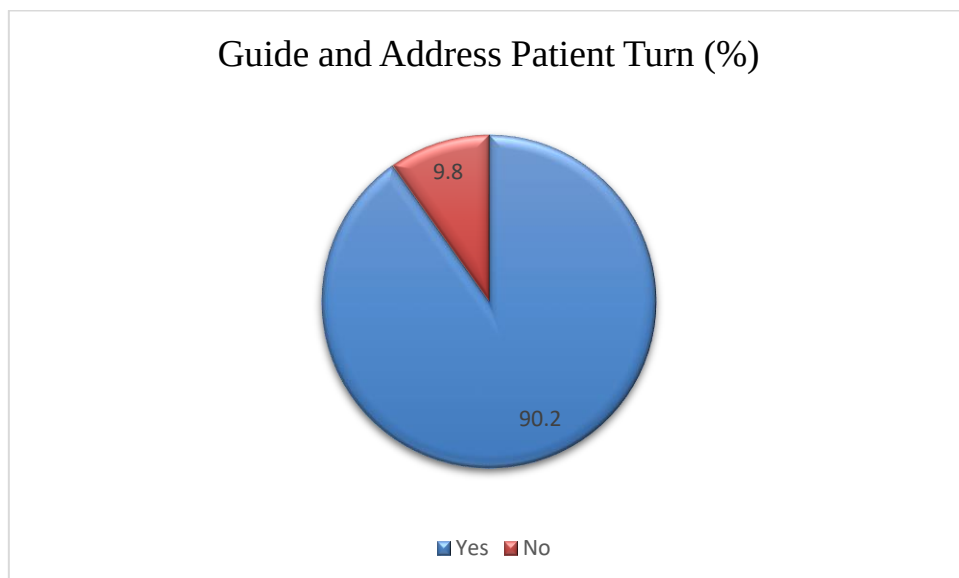


Figure 15: Percentage of nursing staff's guidance and addressing for their turn

Patient satisfaction with their total nursing experience was found to be at 82%.

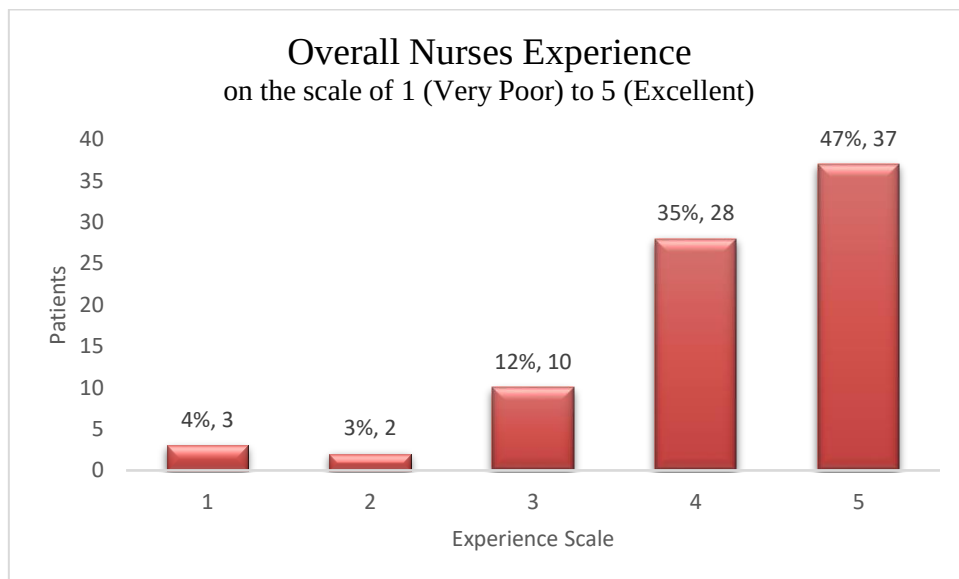


Figure 16: Overall nurses experience on the floor

Approximately 22% of patients needed assistance from the transportation staff and on average, they waited for 16 minutes.

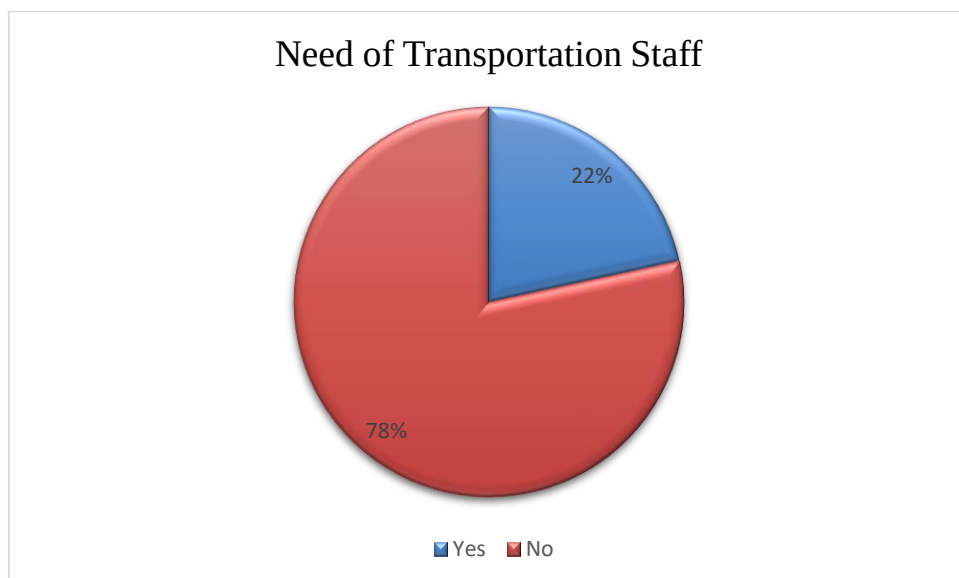


Figure 17: Percentage need of transportation staff

About 45% of patients said they were extremely satisfied with their time on the floor in general. Additionally, 37% of patients said they were satisfied with their whole experience, while 18% said they were disappointed.

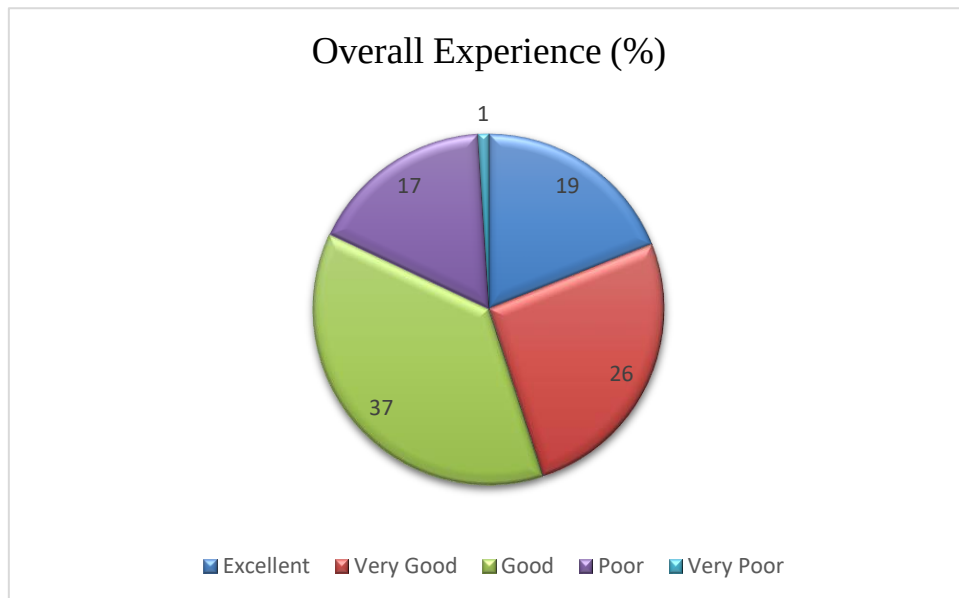


Figure 18: Overall experience on the floor

Chapter 5: DISCUSSION

The MSK and orthopedics OPD used a QMS for nurse assessment with the goal of enhancing patient flow and satisfaction by minimizing extremely lengthy lineups, cutting waiting times, and removing needless motions to various touchpoints. The study's findings shed important light on the QMS's efficacy and its effects on numerous facets of the patient experience.

Significant improvements in numerous important areas were found when pre- and post-QMS data were analyzed. Following the QMS's introduction, both the avg. wait time for nurse assessments and the queue at the nursing counter both shrank. As a result, the nursing assessment process was more effective, and bottlenecks were successfully resolved by the QMS. These results agree with prior study done by Corrigan that shown the beneficial effects of QMS implementation on lowering wait times and improving patient flow and satisfaction. (13)

The introduction of the token system was well-received and effectively assisted the nursing assessment process, as evidenced by the high proportion of patients (74.5%) who collected the nursing token. Also, the high number of patients (84%) thought it was a good idea. The token system simplified the nurse assessment procedure and gave patients an organized approach. Patients claimed that the nursing staff guided them and spoke to them when it was their turn, which shows that the staff actively participated in maintaining a smooth and well-organized patient flow. This is in accordance with Aiken's research, which emphasizes the value of employee participation and communication in queue management systems. (15)

In addition, the majority of patients (82%) indicated that they were satisfied with their overall nursing experience, indicating that they had a favorable opinion of the services offered and that the nursing staff had shown professionalism, competence, and a high standard of care. According to Donabedian's research, nurse service satisfaction is essential for overall patient satisfaction and successful medical results. (16)

It also showed that the QMS installation significantly reduced staff workload and increased workflow effectiveness. By decreasing wait times, removing unnecessary jobs, and improving overall operational efficiency, the introduction of a QMS had a favorable influence on staff load. The Smith study supports the notion that QMS can dramatically

lessen staff workload and increase productivity in OP clinics. (6, 17)

It's critical to recognize areas that can be used for improvement. Even though most patients were pleased with the billing service, a sizeable portion (13%) gave it a negative rating. This demonstrates the necessity of further reviewing and streamlining the billing procedure to solve the issues raised by unhappy patients. In addition, even if there has been a minor decrease in the CW time, there is still room for improvement to reduce patient wait times and raise satisfaction levels generally.

According to the questionnaire study, a sizable majority of patients (63%) were first timers at the OPD. Their feedback offers insightful information about their initial views of the OPD services as well as the effects of the improvements that have been made. This emphasizes how crucial it is to take new visitors' opinions into account when assessing the QMS's efficacy.

LIMITATIONS

- **Time Restrictions:** The study was completed in just three months, which is quite a brief time frame.
- **Limited Sample Size:** Only 80 questionnaires were gathered for the study, along with TM data on those 80 patients (Pre- and Post- QMS implementation).
- **Single Healthcare Setting:** Because the study was conducted in a single MSK and orthopedics OPD, there may be some limitations on how broadly the findings may be applied to other healthcare settings. It's possible that different OPDs or medical specializations have distinctive qualities and procedures that can affect patient flow and satisfaction.
- **Potential Bias:** Since questionnaires were used to acquire the data, there is a chance that respondents' answers may have been biased. It's possible for patients to give answers that are socially acceptable or to remember events incorrectly. In addition, patients' actions and answers may be impacted by researchers' presence during data collecting.
- **Exclusion of Patients Requiring Further Procedures:** the exclusion of patients from the analysis who needed Patients only coming for follow-up, dressing and emergency cases. Also, all ANC's and PNC's cases.

- Limited Range of factors: The study concentrated on a small range of factors, including billing, consultation, nurse assessment, and waiting times. The facility layout, staff communication, and other variables that can affect patient flow and satisfaction were not thoroughly examined.

Chapter 6: CONCLUSION

Patient flow and satisfaction have improved as a result of the MSK and orthopedics OPD's deployment of a QMS for nursing assessment. According to the results, the QMS handled bottlenecks in an efficient manner, decreased wait times, and improved the patient experience as a whole. Patients expressed favorable opinions of the nursing staff, high levels of satisfaction, and a preference for the token system. The billing procedure and CW times are two areas that could still be used for some work, though, to offer a better overall healthcare experience.

The study shed important light on how the QMS affects patient satisfaction and flow. The reduction in nursing evaluation wait times, along with the waiting times at the nursing counter and for the entire consultation procedure, show that the QMS has been successfully implemented. The implementation of the token system made patient flow easier and guaranteed a better organized procedure for nursing assessments. Additionally, the direction and assistance offered by the nursing staff, combined with the positive feedback from patients, emphasize the significance of excellent communication and patient-centered care in boosting the general patient experience.

RECOMMENDATIONS

- **Improve Billing Process:** Even though most patients were satisfied with the billing service, 13% of them gave it a negative rating, it is crucial to address their issues. Consider taking steps to improve staff training, establish effective documentation protocols, and reduce errors and delays in the billing process.
- **Optimize Consultation Wait Time:** Despite a minor decrease in CW times, more work needs to be done to significantly reduce patient wait times. This can entail putting appointment scheduling methods into place, making the most of doctors' available.
- **Create a Separate Queue or allocated Counters for Patients with Pre-Booked Appointments:** At the billing section, create a different queue or allocated counters for patients with pre-booked appointments. In addition to shortening wait times and assuring a better flow for both walk-in and scheduled appointment patients, this

would assist these patients' billing procedures move along more quickly.

- **Continuous Staff Training:** Provide continual training to the nursing and billing staff to improve their patient management, effective communication, and customer service abilities. This will guarantee the delivery of high-quality care consistently, increase patient satisfaction, and foster a positive environment within the OPD.
- Establish a method for routinely tracking patient flow, wait times, and levels of satisfaction. Asking patients for input at random will help you find areas that need improvement and monitor how well adjustments you make are working. This feedback can assist in spotting any new problems and direct future adjustments to the OPD procedures.

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ANNEXURE

Annexure 1: Checklist for Time Motion Analysis

Patient
Cash/ Panel patients
Started Time (Stopwatch)
Billing wait (in mins)
Billing time (in mins)
Nursing assessment wait (in mins)
Nursing assessment time (in mins)
Counter no. 2 time (in mins)
Consultation waits (in mins)
Consultation time (in mins)
Doctor name
Total Waiting Time (in mins)

Annexure 2: Questionnaire on OPD Feedback

7th OPD Feedback

Dear All,

We have been working on making the process flow better for OPD consultation on the 7th-Musculoskeletal and orthopaedics floor. In order to be able to serve our patients better, we would like to hear from the patients and attendants about their experience throughout.

Thank you for your time.

Name*

Contact Number*

Name of treating doctor/ उपचार करने वाले चिकित्सक का नाम *

UHID

Are you visiting Medanta first time? / क्या आप पहली बार मेडांता आए हैं ?*

- Yes
- No

Please rate your billing experience on a scale of 1 to 5. / कृपया अपने बिलिंग अनुभव को 1 से 5 के पैमाने पर मूल्यांकन करें। *

Very Poor 1 2 3 4 5 Excellent

Did you take token for Nursing Assessment? / क्या आपने नर्सिंग असेसमेंट के लिए टोकन लिया था?*

- Yes
- No

Were you guided by the Billing staff to token machine? / क्या आपको बिलिंग स्टाफ द्वारा टोकन मशीन के लिए निर्देशित किया गया था?*

- Yes
- No
- Didn't take token/ Came for Dressing/ To show reports.

How would you rate the idea of token system for getting vitals checked? / आप यह विटल्स की जांच के लिए टोकन सिस्टम के विचार को कैसे मूल्यांकन करेंगे?*

Very Bad 1 2 3 4 Very Good

Were you guided to the Counter No.2 from Nursing Assessment Room? / क्या आपको नर्सिंग असेसमेंट रूम से काउंटर नंबर 2 की ओर निर्देशित किया गया था?*

- Yes
- No

Did nursing staff address and guided you for your turn? / क्या नर्सिंग स्टाफ ने आपकी बारी के लिए आपको संबोधित किया और आपका मार्गदर्शन किया?*

- Yes
- No

How would you rate your experience with the nurses of the floor? / आप सातवीं मंजिल की नर्सों के साथ अपने अनुभव का मूल्यांकन कैसे करेंगे?*

Very Poor 1 2 3 4 5 Excellent

Did you need a transportation staff for you/ your patient? / क्या आपको/आपके रोगी के लिए परिवहन कर्मचारियों की आवश्यकता थी?*

- Yes
- No

How long did you have to wait for your transport staff?/ आपको परिवहन कर्मचारियों के लिए कब तक प्रतीक्षा करनी पड़ी?

How was the overall experience on the floor?/ सातवीं मंजिल पर समय अनुभव कैसा रहा?*

- Very Good
- Good
- Poor
- Very Poor
- Excellent

Suggestions, if any/ सुझाव, यदि कोई हो *