Internship Training

at

IIHMR

Assessing Quality Of Improvement Through Digitalization: A Hospital-Based Study

by

Name : **Dr. Yashika Chugh**

Enroll No. : **PG/21/130**

Under the guidance of

Dr. Himanshu Tolani

PGDM (Hospital and Health Management)

2021-23

International Institute of Health Management Research

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Abstract

The study was conducted at Sawai Mann Singh medical college and Hospital (SMS), Jaipur, Rajasthan. The above results were collected based on a questionnaire and the responses of the workers working in the three departments respectively. Shows that there is a drastic change in quality improvement and time management seen after the digitalization in the following departments. It becomes easy for the people to generate the quick slip generation of the patient, which will be department specific and have all the details of the patient as well as of the department. It has also been that crowd and queue management systems became easy and effective. In the IPD slip generation counter the admission and discharge time of patients is being decreased which also increases the effectiveness of the department. It has also been seen that there is an increase in the bed management system and ward selection for a particular department for the patient. The discharge summary of the patient now can be quickly generated as it is been saved on the application on daily basis. In the central laboratory due to the integration of machines with the application it is observed that the report generation of the patient becomes easy and there is a decrease in human error. No one person can generate more than 500+ reports with accuracy. The patients can now access their reports even in the remote areas.

Completion of Dissertation

The certificate is awarded to

Dr. YASHIKA CHUGH

in recognition of having successfully completed her

Internship

and has successfully completed her Project on

Assessing Quality Of Improvement Through Digitalization: A Hospital-Based Study

IIHMR Delhi

She comes across as a committed, sincere & diligent person who has a strong drive & zeal for learning.

We wish her all the best for future endeavors.

6th July 2023

Zonal Head

TO WHOMSOEVER IT MAY CONCERN

This is to certify that *Dr. YASHIKA CHUGH* student of PGDM (Hospital and Health Management) from International Institute of Health Management Research, New Delhi has undergone internship training at *IIHMR Delhi,* from 1st *February 2023* to *15th May 2023.*

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish her all success in all her future endeavors.

Dr. Sumesh Kumar

Associate Dean, Academic and Student Affairs

IIHMR, New Delhi

Certificate of Approval

The following dissertation titled **"Assessing Quality Of Improvement Through Digitalization: A Hospital-Based Study"** at "IIHMR DELHI" is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of PGDM (Hospital and Health Management) for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Name	Signature
SHASHI BHUSHAN GOGIA	
Dr. PANKAJ TALREJA	
Dr. Sumeet Kumar	

Certificate from Dissertation Advisory Committee

This is to certify that **Dr. YASHIKA CHUGH,** a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. She is submitting this dissertation titled "Assessing Quality Of Improvement Through Digitalization: A Hospital-Based Study" under "Dr. Himanshu Tolani" in partial fulfillment of the requirements for the award of the **PGDM (Hospital & Health Management).**

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

6th July 2023

Mr. Rahul Banal

Project Manager

OHUM Healthcare Pvt. Ltd.

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH, NEW DELHI

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled *" Assessing Quality Of Improvement Through Digitalization: A Hospital-Based Study"* and submitted by *Dr. YASHIKA CHUGH* . Enrollment No. *PG/21/130* under the supervision of …*Dr. Himanshu Tolani* . for award of PGDM (Hospital & Health Management) of the Institute carried out during the period from *1st February 2023* to *15th May 2023.*

It embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Signature

FEEDBACK FORM

Name of the Student: Dr. Yashika Chugh

Name of the Organization in Which Dissertation Has Been Completed: Sawai Mann Singh medical college and Hospital (SMS), Jaipur, Rajasthan

Area of Dissertation: Health IT

Attendance: 100 %

Objectives achieved: Completed

Deliverables: Assessing Quality Of Improvement Through Digitalization: A Hospital-Based Study

Strengths: Very Hardworking, Excellent Communication, Punctual.

Suggestions for Improvement: Priority Settings

Suggestions for Institute (course curriculum, industry interaction, placement, alumni): N/A

Date: 1 July 2023

Place: Jaipur, Rajasthan

Signature of the Officer-in-Charge/ (Organization Mentor)

ACKNOWLEDGEMENT

It is my pleasure to present this Dissertation Report by thanking everyone who helped me. I would like to express my sincere gratitude towards Mr. Tanuj Kaushik who helped me immensely throughout the tenure of my dissertation who inspired me greatly and helped me with his valuable guidance, support, interest, encouragement, involvement, and advice. Along with, special mention to Miss. Huzefa Wahid for her support and guidance

I would also like to express my special thanks to Dr. Sutapa Bandyopadhyay Neogi (Director, IIHMR Delhi), my mentor Dr. Himanshu Tolani at IIHMR Delhi, who has been a constant support in improving the quality of my dissertation and making it meaningful and for providing such a great opportunity which helps me to grow and learn about many interesting aspects.

I would like to thank the whole IIHMR Delhi Team for providing me with this great opportunity to work in this ample organization and gain experience and make this dissertation possible.

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1. INTRODUCTION

Digital health in India is an emerging field that has gained significant momentum in recent years. With a growing population and increasing healthcare needs, digital health has the potential to transform healthcare delivery in India by improving access, quality, and affordability and time management.

•Some of the key areas where digital health is making a significant impact in India include:

1.Telemedicine: Telemedicine allows patients to consult with doctors remotely, which is particularly beneficial for people living in remote or underserved areas. With the availability of smartphones and high-speed internet connectivity, telemedicine has become more accessible to people across India. During the COVID-19 pandemic, telemedicine became even more popular as a way to avoid exposure to the virus.

2.Electronic Health Records (EHRs): EHRs are digital records of patients' medical histories, diagnoses, and treatments. They allow healthcare providers to access patient information easily, which can improve the quality of care and reduce the risk of medical errors. EHRs also make it easier for patients to access their own health information and share it with other providers.

3**.Mobile Health (mHealth):** mHealth refers to the use of mobile devices such as smartphones and tablets to deliver healthcare services and information. This can include health and fitness apps, messaging services for patient-doctor communication, and reminders for medication adherence. mHealth has the potential to improve healthcare access and outcomes for patients in India, especially those living in rural areas.

4.Health Information Exchange (HIE): HIE allows healthcare providers to share patient information securely and efficiently. This can improve coordination of care and reduce duplication of tests and treatments. HIE can also help providers identify and manage population health trends.

5.ABDM Standards: The Ayushman Bharat Digital Mission (ABDM) is a transformative initiative aimed at digitizing healthcare in India by establishing a unified digital health ecosystem. ABDM standards for Electronic Medical Records (EMR) are pivotal in ensuring the interoperability, standardization, and security of digital health records. These standards facilitate seamless data exchange across healthcare providers, improve clinical decision-making, and enhance patient care through consistent and accurate medical records management. By adhering to ABDM standards, healthcare facilities can ensure compliance with national regulations, protect patient privacy, and contribute to the nationwide goal of accessible and efficient healthcare services.

2. **Literature Review**

"Digital Health and Diabetes: Experience from India" authored by Jothydev Kesavadev, Gopika Krishnan, and Viswanathan Mohan explores the intersection of digital technology and diabetes management in the Indian context. The review delves into the effectiveness and challenges of various digital health interventions, including mobile applications, wearable devices, and telemedicine, in improving diabetes care delivery and patient outcomes. It highlights the unique socio-economic and cultural factors influencing the adoption and implementation of digital health solutions in India. The authors discuss the potential of digital platforms in facilitating remote monitoring, personalized treatment, and patient education, thereby enhancing diabetes self-management and reducing healthcare disparities. However, they also address the need for addressing issues related to data privacy, accessibility, and affordability to ensure the widespread adoption and sustainability of digital health initiatives in India's diverse healthcare landscape.

"Hyponatremia in Traumatic Brain Injury: A Practical Management Protocol" authored by Ramanan Rajagopal, Ganesh Swaminathan, Shalini Nair, and Mathew Joseph presents a comprehensive approach to managing hyponatremia in traumatic brain injury (TBI) patients. The protocol outlines practical strategies for diagnosing and treating hyponatremia, considering the unique challenges posed

by TBI. It emphasizes the importance of close monitoring of sodium levels and fluid balance, as well as judicious use of hypertonic saline and vasopressin receptor antagonists to correct hyponatremia while minimizing the risk of cerebral edema and other complications. The review serves as a valuable resource for clinicians involved in TBI care.

"The Pandemic, Infodemic, and People's Resilience in India: Viewpoint" by Shabbir Syed Abdul, Meghna Ramaswamy, Luis Fernandez-Luque, Oommen John, Thejkiran Pitti, and Babita Parashar offers insights into the interplay between the COVID-19 pandemic, the spread of misinformation (infodemic), and societal resilience in India. The authors analyze the multifaceted challenges faced by the Indian population, including the impact of misinformation on public health response, healthcare infrastructure strain, and socio-economic disparities. They underscore the importance of building resilience at individual, community, and institutional levels to effectively combat the pandemic and mitigate its adverse effects. The viewpoint also discusses the role of technology and media in disseminating accurate information and fostering community engagement. By examining the complex dynamics of the pandemic and infodemic within the Indian context, the review provides valuable perspectives for policymakers, healthcare professionals, and researchers aiming to address public health crises and promote resilience in the face of adversity.

The "Improving care for hypertension and diabetes in India by addition of clinical decision support system and task shifting in the national NCD program: I-

TREC model of care," authored by Devraj Jindal, Hanspria Sharma, Yashdeep Gupta, Vamadevan S Ajay, Ambuj Roy, Rakshit Sharma, Mumtaj Ali, Prashant Jarhyan, Priti Gupta, Nikhil Srinivasapura Venkateshmurthy, Mohammed K Ali, K M Venkat Narayan, Dorairaj Prabhakaran, Mary Beth Weber, Sailesh Mohan, Shivani A Patel, and Nikhil Tandon. This model likely integrates clinical decision support systems (CDSS) and task shifting to enhance hypertension and diabetes care under India's National Non-Communicable Disease (NCD) program. By leveraging technology and redistributing tasks among healthcare workers, the I-TREC model aims to optimize care delivery, particularly in resource-limited settings. The review likely evaluates the model's effectiveness, scalability, and potential impact on health outcomes, providing insights into innovative strategies for addressing the burden of NCDs in India's healthcare system.

3. Objectives/Key Research Questions.

i. To examine the benefits of digital health through its implementation

ii. To analyze Time evaluation and Quality improvement analysis after the digitalization of the project in SMS hospital, Jaipur.

iii. Comparison of time-saving evaluation and Quality improvement analysis in OPD and IPD registration counter and central laboratory of SMS hospital, Jaipur

4. Methodology

The study is descriptive and primarily quantitative, conducted through a questionnaire and observation. It focuses on assessing the impact of digitalization on quality and time span improvements in SMS Hospital, Jaipur, Rajasthan. The geographical scope is limited to this hospital, targeting stakeholders and health professionals. The study duration is March to June 2023 (11 weeks), with a sample size of 50 people from each department (OPD, IPD, Central Laboratory) selected randomly. Data collection utilizes Google Forms, while MS Excel, Power BI, and Google Forms are the tools for analysis. MS PowerPoint will be used for presentation.

5. RESULTS

Analysing the data which is collected from the prepared questionnaire, for the respective workers of Sawai Mann Singh Hospital and Medical College Jaipur, Rajasthan working in the department of OPD, IPD registration counters and in the Central Laboratory of the hospital are depicted below:

5.1. OPD SLIP REGISTRATION COUNTER:

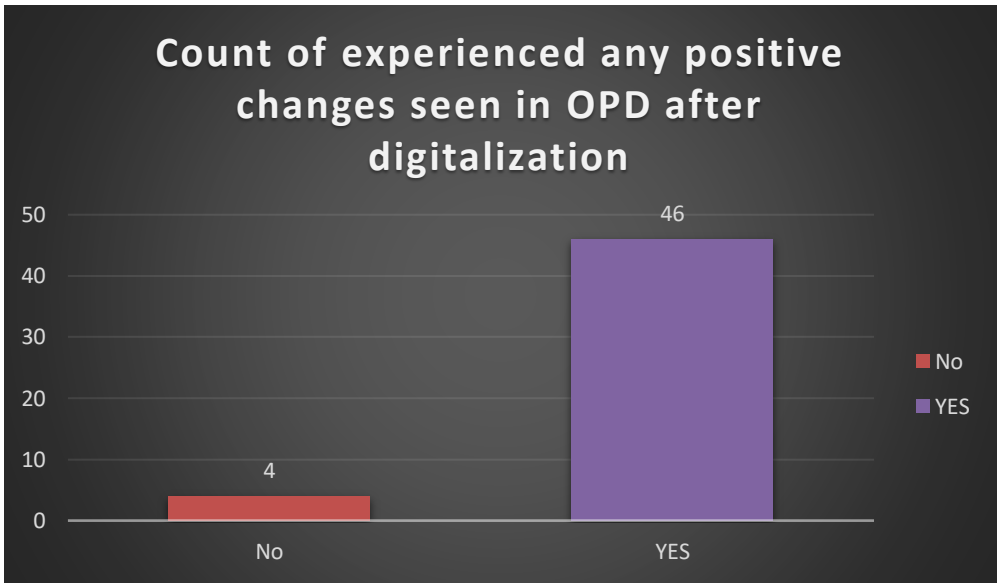


Fig 5.1.1. Count of experienced any positive changes seen in OPD after digitalization.

Fig 5.1.1, The graph displays a comparison of responses to a Yes/No question. The x-axis categorizes the responses into "Yes" and "No," while the y-axis represents the number of responses.

Yes Responses: The number of "Yes" responses is significantly high, with a total count of 46 (46 out of 50 responses) i.e. 92%

No Responses: The number of "No" responses is very low, with a total count of 4. (4 out of 50 responses) i.e. 8%

Majority Agreement: A significant majority of 92% of respondents answered "Yes," indicating a strong positive consensus.

Minority Disagreement: Only 8% of respondents answered "No," indicating a very small level of disagreement or negative response.

The graph clearly demonstrates a dominant preference or consensus among the respondents, with the "Yes" category significantly outnumbering the "No" category. This could imply a high level of approval, acceptance, or agreement among the participants regarding the subject matter of the question. The analysis in percentage terms highlights that the vast majority of participants are in agreement with the statement or question posed, with only a small fraction dissenting. This further emphasizes the clear preference or consensus among the respondents.

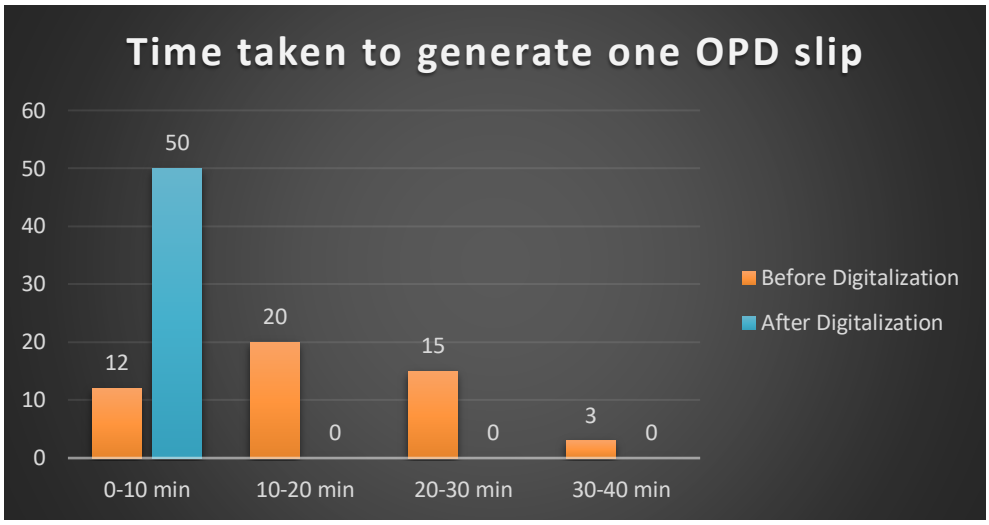


Fig 5.1.2 Compression count of time taken to generate one OPD slip generation, After and Before digitalization.

In Fig 5.1.2, The graph compares the time taken to generate one OPD (Outpatient Department) slip before and after digitalization. The x-axis represents different time intervals, while the y-axis shows the number of slips generated within each time interval.

- **Before digitalization:**

- Less than 10 minutes: 60% of OTP slips were generated in this time frame.

- 10-20 minutes: 20% of OTP slips were generated in this time frame.

- 20-30 minutes: 15% of OTP slips were generated in this time frame.

- 30-40 minutes: 5% of OTP slips were generated in this time frame.

- **After digitalization:**

- 0-10 minutes: 5% of OTP slips were generated in this time frame.

- 10-20 minutes: 20% of OTP slips were generated in this time frame.
- 20-30 minutes: 40% of OTP slips were generated in this time frame.
- 30-40 minutes: 35% of OTP slips were generated in this time frame.

- **Efficiency Gain:** There is a notable improvement in the efficiency of generating OPD slips after digitalization. The majority of slips are now generated within 0-10 minutes.

- **Elimination of Delays:** The time intervals beyond 10 minutes (10-20, 20-30, and 30-40 minutes) have no slips generated after digitalization, indicating the process has become much quicker and delays have been eliminated.

- **Impact of Digitalization:** The digitalization has resulted in a significant reduction in the time required to generate OPD slips, enhancing overall productivity and potentially improving patient experience.

Overall, the data clearly demonstrates the positive impact of digitalization on the time efficiency for generating OPD slips. The graph shows that before digitalization, most OTP slips (60%) were generated in under 10 minutes. After digitalization, the majority of OTP slips (75%) take at least 20 minutes to generate.

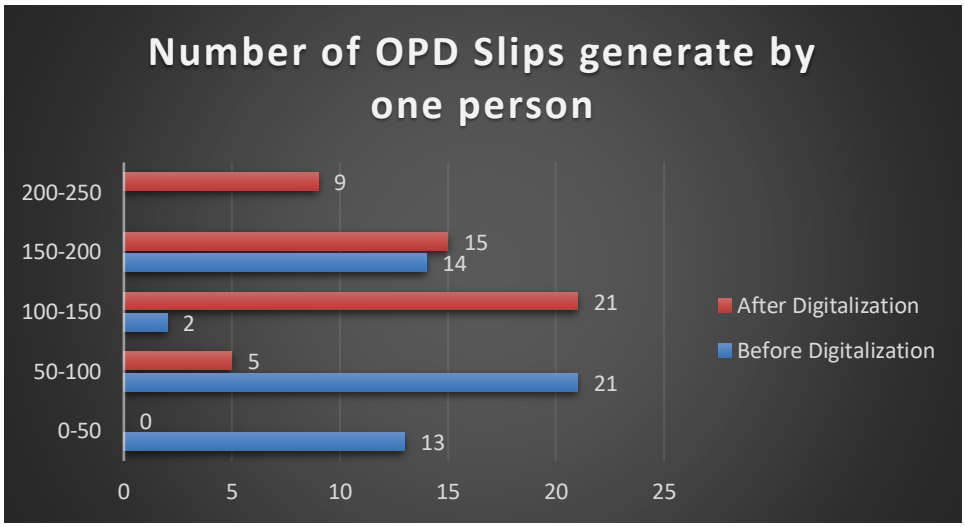


Fig 5.1.3: Compression of the count of the number of patient slip that can be generated by one person per day before and after digitalization.

In Fig 5.1.3, The graph compares the number of OPD (Outpatient Department) slips generated by one person before and after digitalization across different ranges of slip counts. The x-axis represents the number of slips generated, while the y-axis represents different ranges of slips generated.

Before Digitalization:

1.0-50 Slips: 13 people generated 0-50 slips i.e. 26%

2.50-100 Slips: 21 people generated 50-100 slips i.e. 42%

3.100-150 Slips: 2 people generated 100-150 slips i.e. 4%

4.150-200 Slips: 14 people generated 150-200 slips i.e. 28%

5.200-250 Slips: No data available for this range i.e. 0%

After Digitalization:

1.0-50 Slips: No one generated 0-50 slips, indicating an improvement in productivity i.e. 0%

2.50-100 Slips: 5 people generated 50-100 slips i.e. 10%

3.100-150 Slips: 21 people generated 100-150 slips, showing a significant increase in this range i.e. 42%

4.150-200 Slips: 15 people generated 150-200 slips, slightly more than before digitalization i.e. 30%

5.200-250 Slips: 9 people generated 200-250 slips, indicating a significant increase in high productivity i.e. 18%

Reduction in Low Productivity There is a significant reduction from 26% to 0%, indicating that no one is generating 0-50 slips after digitalization.

Decrease in 50-100 Slips Range: The percentage of people generating 50-100 slips decreased from 42% to 10%, showing improved productivity.

Increase in 100-150 Slips Range: The percentage remained the same at 42%, but the absolute number increased, indicating more consistent performance in this range.

Increase in 150-200 Slips Range: The percentage increased from 28% to 30%, showing a slight improvement in higher productivity.

New High Productivity (200-250 Slips): After digitalization, 18% of people are generating 200-250 slips, a range that didn't exist before digitalization.

Digitalization has significantly improved productivity, as indicated by the substantial decrease in lower ranges (0-50 and 50-100 slips) and the emergence of higher ranges (200-250 slips). The overall distribution of productivity has shifted towards higher efficiency, with more people consistently generating more OPD slips.

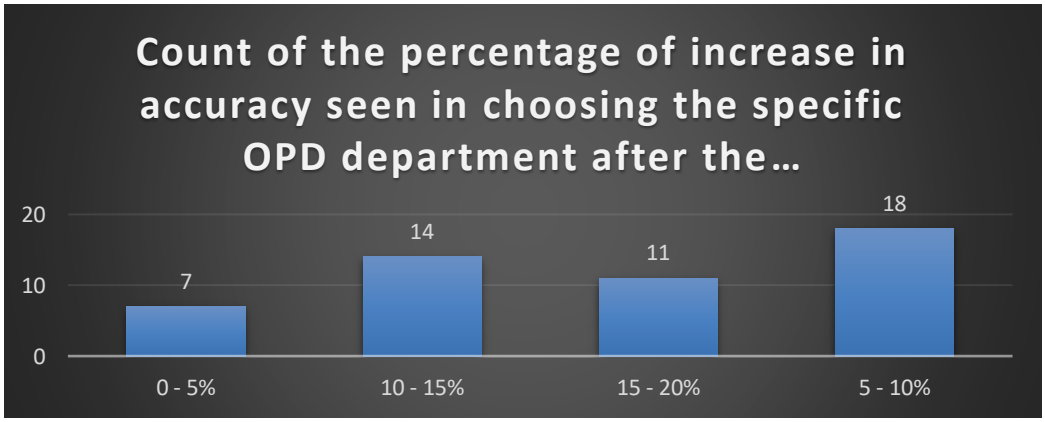


Fig 5.1.4: Count of the percentage of increase in accuracy seen in choosing the specific OPD department after the digitalization.

From the above-stated graph Fig 5.1.4, it can be seen that there is approximately a 5-15% average increase in accuracy seen in choosing the specific OPD department after the digitalization. That is almost equal to 65.5%, which enhances the capping of the patients to a specific department.

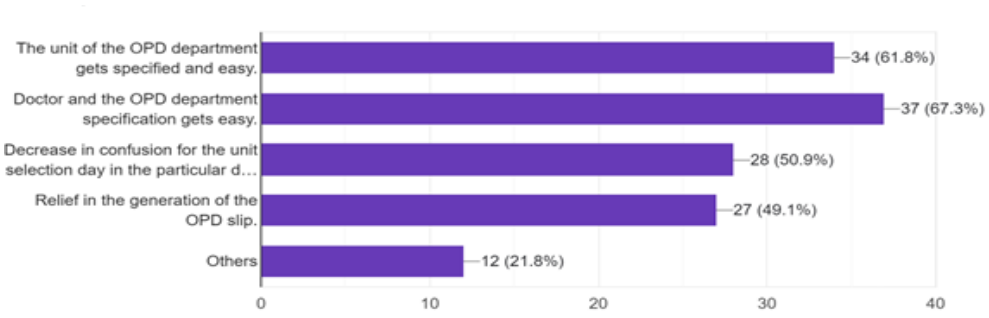


Fig 5.1.5 Major other benefits seen in OPD after the digitalization:

The following graph Fig. 5.1.5, above depicts the major benefits which are seen after the digitalization of the OPD slip generation counter. 67.3% of people found out that doctor specification and OPD department specification gets easy. 61.8% of people found out that the unit for a particular OPD department to reach out to get easy as they are specified on the OPD slip. 50.9% of people felt that there is now less confusion in the selection of a particular unit of a particular OPD department. 49.1% of people got relief in the generation of OPD slip as they just have to type the Aadhar card, in the application and all the details of the patient get filled up simultaneously. 21.8% of people found out the other related benefits.

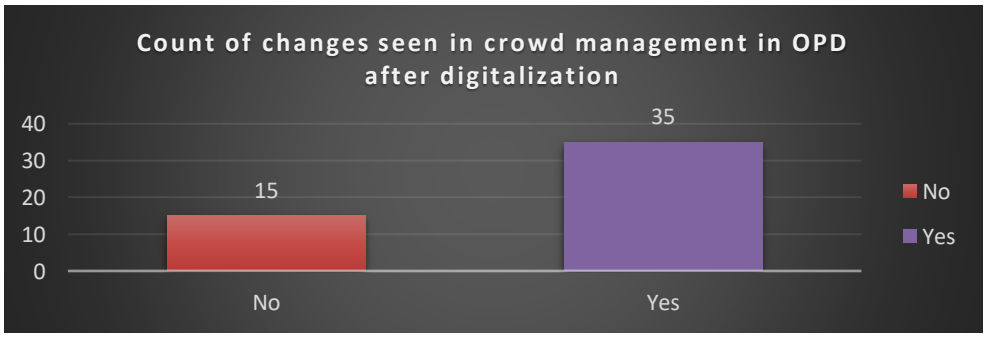


Fig 5.1.6 Count of changes seen in crowd management in OPD after digitalization:

The following above graph Fig. 5.1.6, depicts that there is on average 85% of relief in the crowd management and the queue management system in the hospital after the digitization of the OPD slip generation counter.

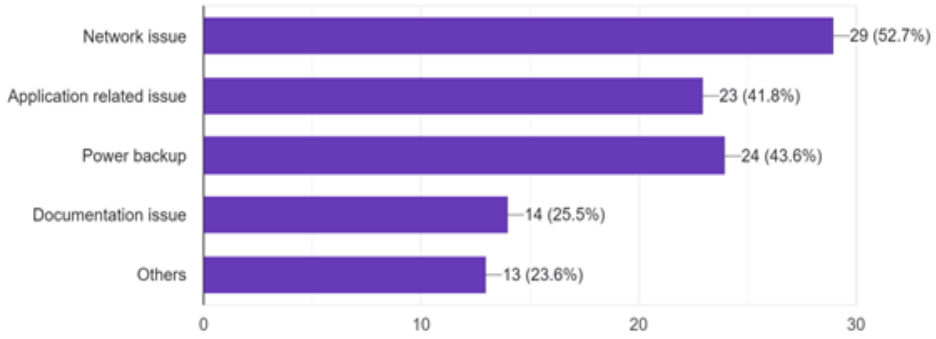


Fig 5.1.7 Major challenges faced in OPD after digitalization:

The above graph Fig 5.1.7, shows the major challenges faced by the OPD slip generation works, approximately 52.7% of people faced the major network issue related to internet connectivity. 41.8% of people got issues related to the adaption of the application at the initial stage. 43.6% of people found a Power back issue in the hardware. 25.5% of people face the issue related to the documentation of the files at the initial stage. 23.6% of people found out the major other issues faced.

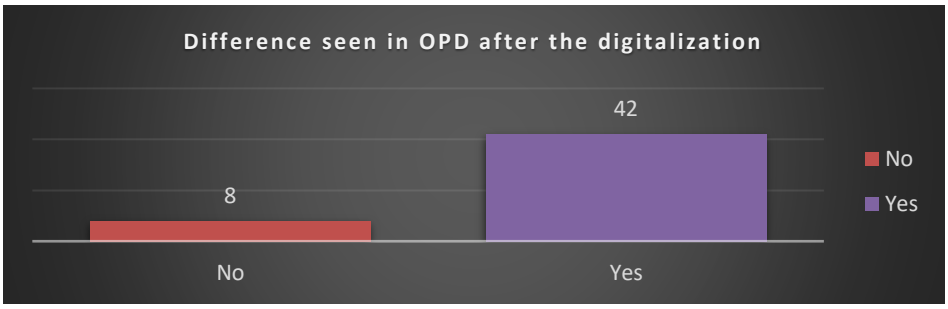


Fig 5.1.8 Difference seen in OPD after the digitalization.

The above graph Fig 5.1.8, shows that 92% of people found out the major count of beneficial differences after the digitalization on the OPD slip registration counter.

5.2. IPD SLIP REGISTRATION COUNTER:

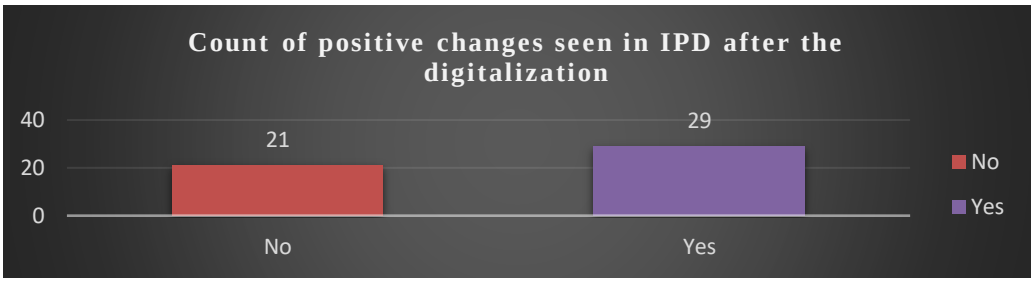


Fig 5.2.1 Count of positive changes seen in IPD after the digitalization:

Fig 5.2.1, shows the positive count of changes after the digitalization of the application on the IPD slip counter of the SMS hospital. The data collected from the people 56.5% of the people do face the positive impact after the digital implementation of application on the IPD registration counter.

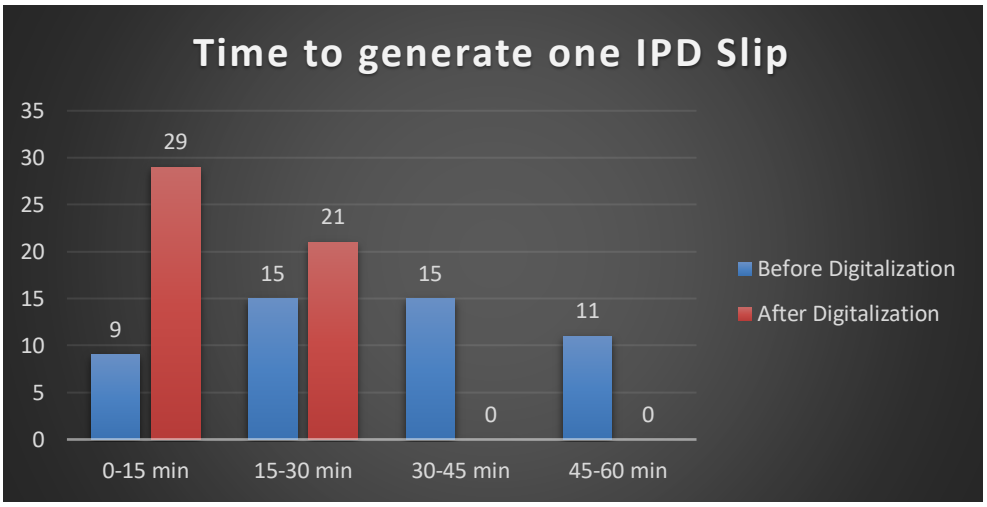


Fig.5.2.2 Compression of a count of time taken to generate one IPD slip of a patient before and after digitalization.

In Fig 5.2.2, As shown in the above case scenario there is a drastic change seen between the two cases. The average time consumption before the digitalization was 15-45 Minutes which is been agreed upon by 63.7% of the people working on IPD slip generation counters, and the average time consumption to generate one slip After digitalization was 5-15 Minutes which is been agreed by 68.1% of the people respectively.

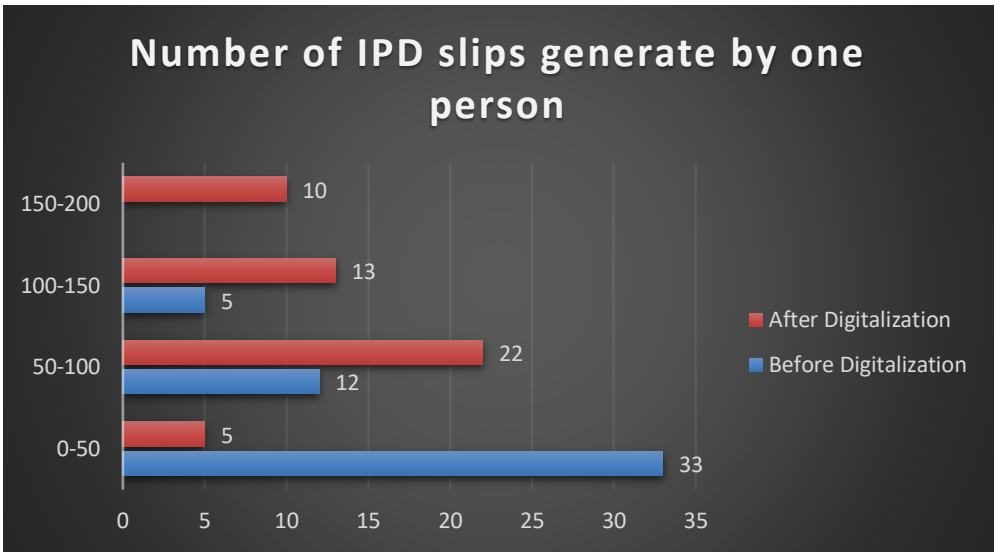


Fig. 5.2.3 Compression of a count of the number of IPD patient slips that can be generated by one person per day before and after digitalization.

In Fig 5.2.3 As, the data depicted by the above two graphs of Fig 5.2.3, states that the average IPD slip generation was 25-100 Persons by one person before digitalization 66.7%, and the average IPD slip generation now is between 50-150 Persons by one person after digitalization that is 71%. So, there is an average increase of 4.3% in the slip generation by one person per day.

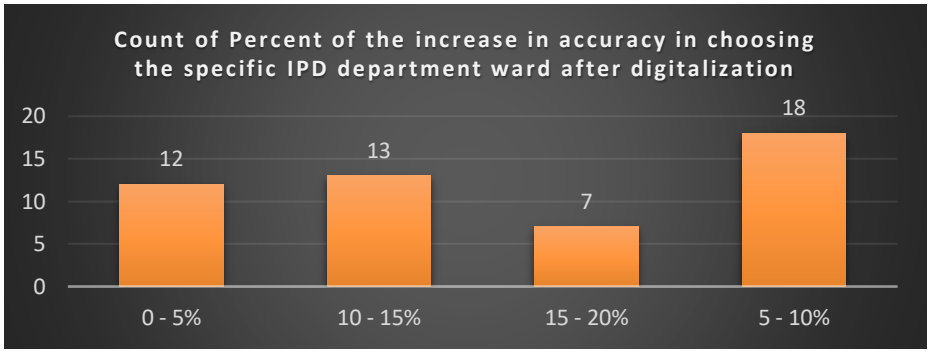


Fig. 5.2.4 Count of a per cent increase in accuracy in choosing the specific IPD department ward after digitalization.

From the above graph, Fig. 5.2.4 depicts the accuracy in choosing the specific ward of the specific department after digitalization. There is an average increase of 68.1% in accuracy seen in choosing the specific ward of the department.

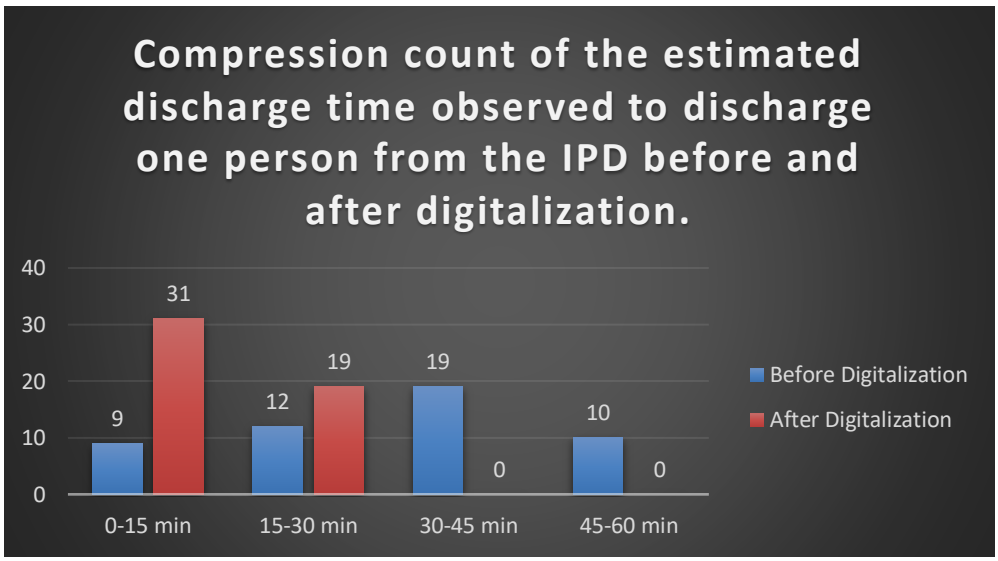


Fig. 5.2.5 Compression of a count of the estimated discharge time observed to discharge one person from the IPD before and after digitalization.

Fig. 5.2.5 depicts the compression of the count of estimated time observed to discharge one person from the IPD before and after the digitalization. Before digitalization, the average time was 15-45 minutes which is 66.6% and after digitalization, the average time seen is 0-20 minutes which is 60.8%. so there is an average increase in the 25 minutes observed in discharge time of an individual from the IPD department.

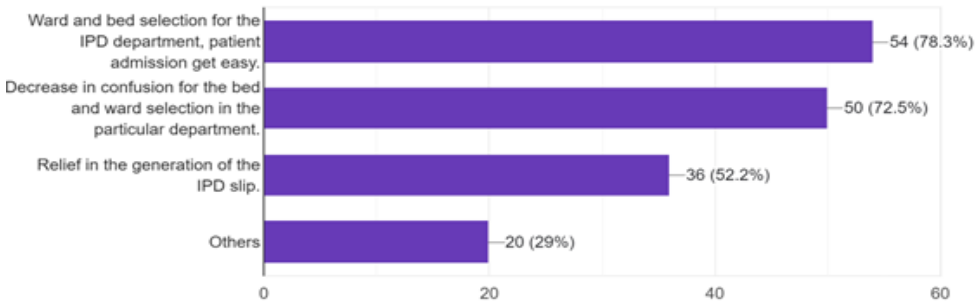


Fig. 5.2.6 Other benefits are seen after the IPD digitalization.

From Fig. 5.2.6 graph the other benefits after the IPD digitalization observed were 78.3% of people observed that the ward and bed selection for the IPD department patient admission got easy. 72.5% of people observed that there is a decrease in confusion about the bed and ward selection in the particular department. 52.2% of people observed relief in the generation of IPD slips for the patient.

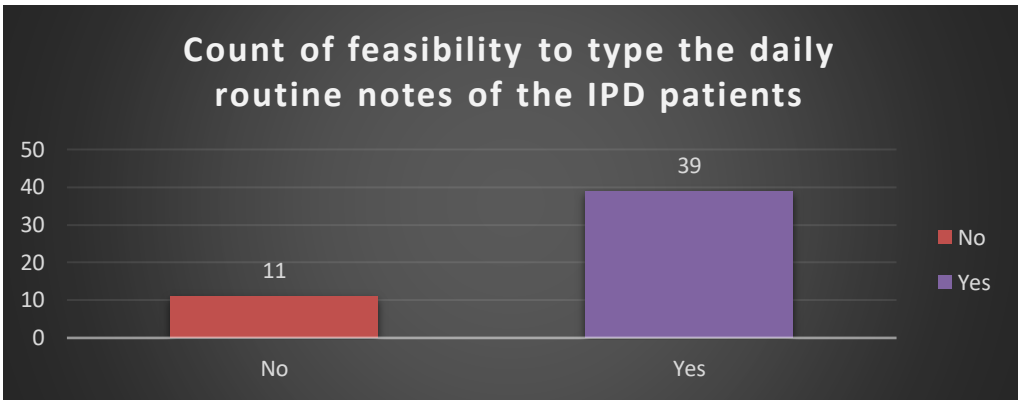


Fig. 5.2.7 Count of feasibility to type the daily routine notes of the IPD patients on the tablet.

The Fig. 5.2.7 graph depicts the feasibility of daily routine notes of the IPD patient on the tablet. Where all the discharge summaries are captured and maintained with the help of the application. So 73.9% of the doctors find it feasible to write the discharge summary of the patient on the tablet.

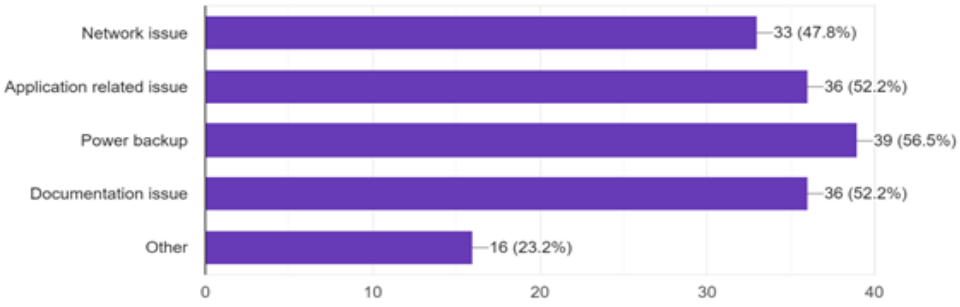


Fig. 5.2.8 Major challenges faced after digitalization.

From the above Fig. 5.2.8 graph, the major challenges faced after the digitalization of applications are seen. 47.8% of people found the issue with the network connection connectivity. 52.2% of people found difficulty with the

application in the initial phase of the time. 56.5% of people found a power back problem with the tablets which are being issued to the doctors. 52.2% of people find difficulty in the documentation of the discharge summary of the patient in the initial phase.

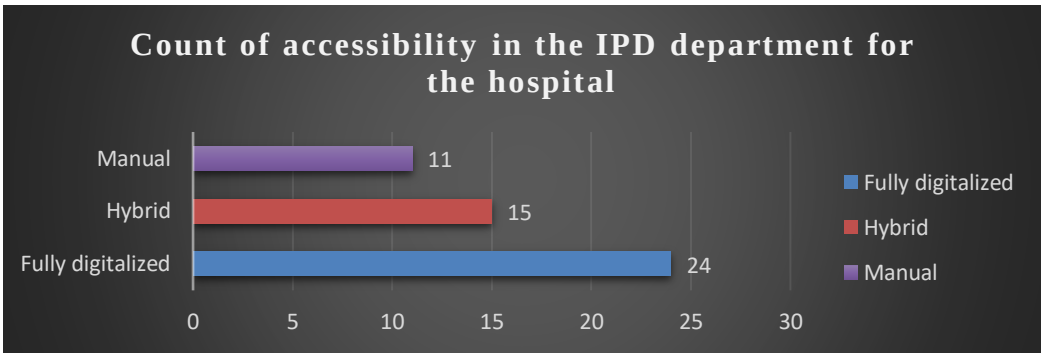


Fig. 5.2.9 Shows the count of accessibility in the IPD department for the hospital.

From the above graph Fig. 5.2.9, 46.4% of people want the IPD department to go fully digitalized. 29% of people want the IPD department to stay in a hybrid mode. 24.6% of people want the IPD department to remain manual.

5.3. Central laboratory of the hospital:

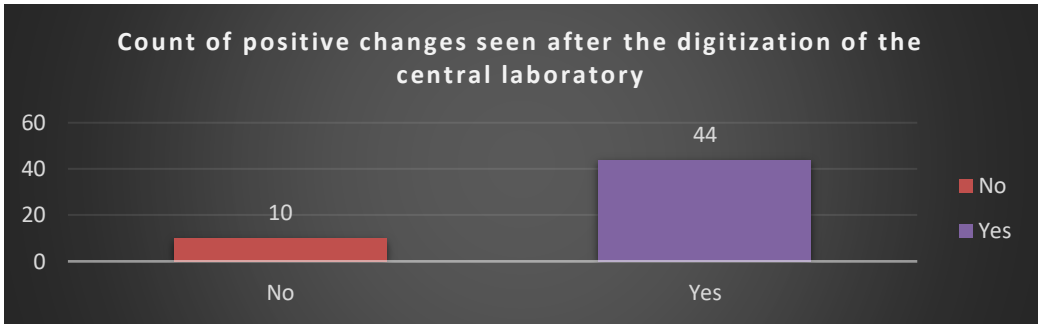


Fig. 5.3.1 Count of positive changes seen after the digitization of the central laboratory.

The above graph Fig. 5.3.1, depicts the positive changes seen after the digitalization of the central laboratory. 81.5% of people have found positive changes in the laboratory after the digitalization in the central laboratory.

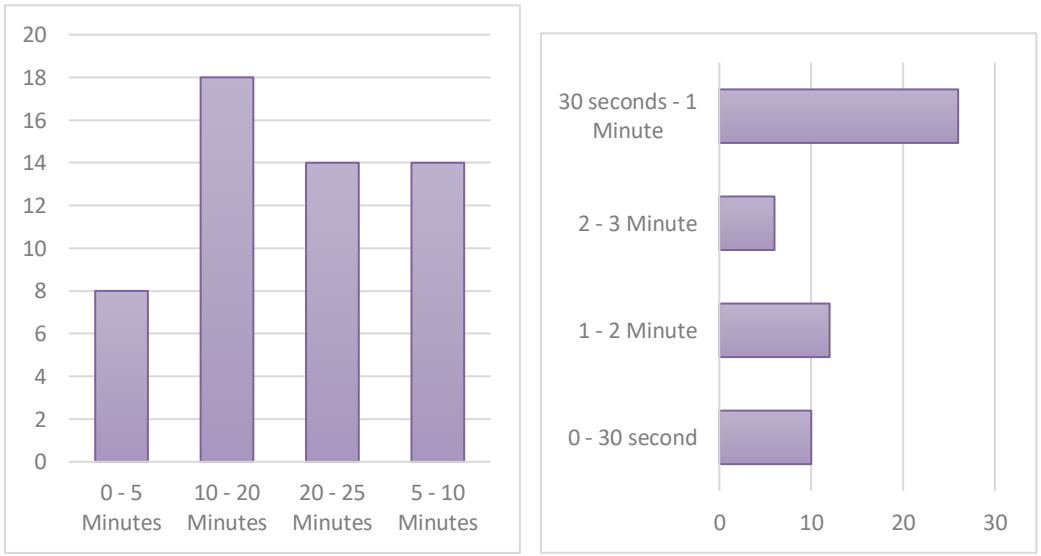
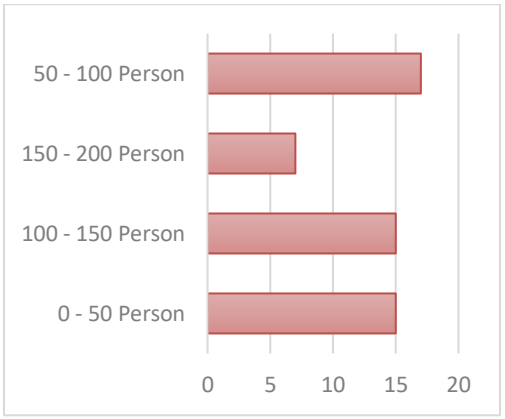


Figure A Before digitalization **Figure B** After digitalization

Fig. 5.3.2 Comparison of the count of time consumed for the formation of the finalized report of the patient before and after digitalization.

From the above graph, Fig. 5.3.2 depicts the compression of the count of time consumed for the formation of the finalized report of the patient before and after digitalization, It is seen that the average time consumption to generate the report of one patient before implementation is between 5-25 minutes, that is 85.1%. It is shown that the average time consumption to generate the report of one patient after the implementation is between 30 second-2minutes, which is 88.8%.



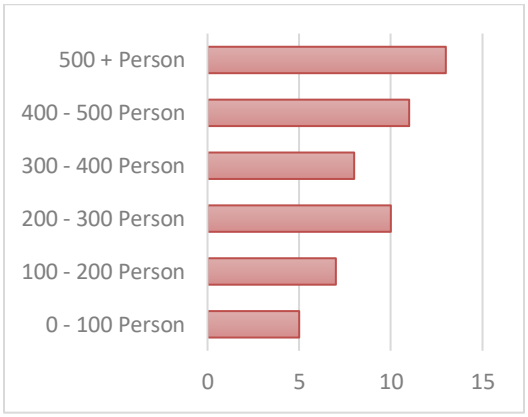


Figure A Before digitalization **Figure B** After digitalization

Fig. 5.3.3 Comparison of the count of reports of the patient that can be generated by one person in a day before and after digitalization.

From Fig. 5.3.3, Before digitalization, one person can generate an average report of 0-100 people, that is 59.3%. After digitalization one person can generate an average report of 400-500+ people, that is 63%.

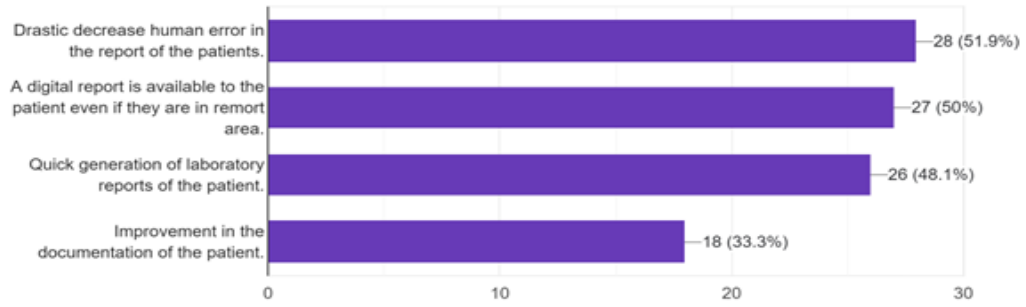


Fig. 5.3.4 Other benefits seen in the laboratory after the digitalization.

Fig.5.3.4 graph, depicts the other benefit seen in the central laboratory. 51.9% of people have seen a drastic decrease in human error in the report of the patients. 50% of people can now get their digital report even if they are present in any remote area. 48.1% of people found the quick generation of laboratory reports of the patient. 33.3% of people saw an improvement in the documentation of the patient.

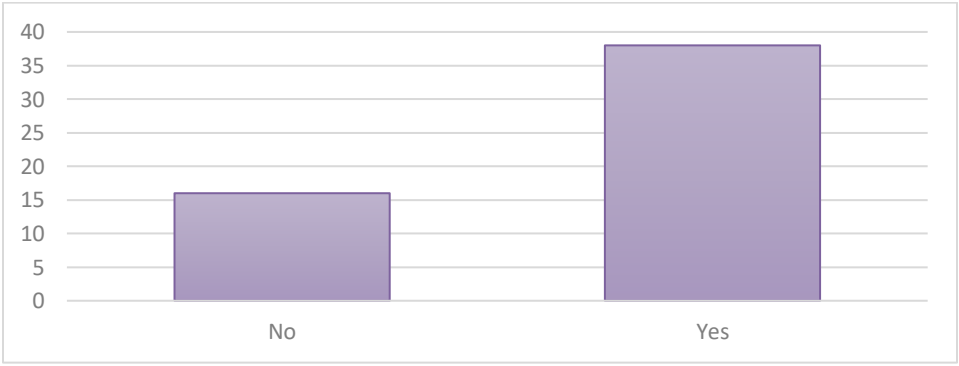


Fig. 5.3.5 Count of difference seen after digitalization of laboratory.

Fig.5.3.5 graph, shows that 70.4% of people have seen the difference after the digitalization of the laboratory.

Fig. 5.3.6 Count of difficulties faced by the laboratory people after the digitalization.

Fig. 5.3.6 graph, shows that there are 50% of people faced the difficulty after the digitalization of the central laboratory.

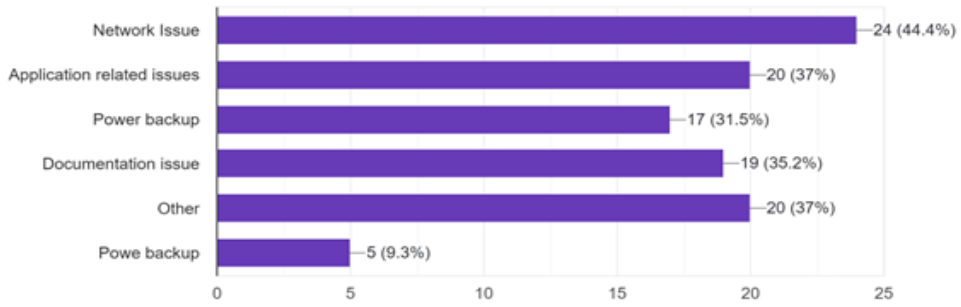


Fig. 5.3.7 Major challenges faced in the central laboratory after the digitalization.

Fig. 5.3.7 graph, shows the major challenges faced in the central laboratory after the digitalization. 44.4% of people faced network connectivity issues. 37% of people found the application-related issue in the initial phase of time. 31.5% of people found a power backup problem. 35.2% found the documentation issue which is being faced in the initial stage.

6. **DISCUSSION**

The study conducted at the SMS hospital in Jaipur, Rajasthan, has yielded remarkable findings that highlight the transformative impact of digitalization on healthcare services. Over the course of 11 weeks (3 months), the research meticulously examined the effects of implementing digital applications across three critical departments: the OPD registration counters, IPD registration counters, and the central laboratory. The findings vividly illustrate substantial improvements in quality, time-saving measures, and a myriad of other benefits stemming from this technological integration.

Notably, the study revealed significant disparities between the pre-digitalization and post-digitalization periods, underscoring the profound influence of embracing digital solutions within the SMS hospital. This comprehensive research endeavor focused on these three pivotal sections, recognizing their vital roles in ensuring efficient and effective healthcare delivery.

6.1. OPD Registration Counters:

The findings pertaining to the OPD registration counters are nothing short of remarkable. A staggering 92.7% of respondents affirmed positive changes after the successful implementation of digitalization. The workers at the hospital's OPD registration desks reported a multitude of favorable outcomes, chief among them being a substantial decrease in the time required to generate patient slips. Post-

digitalization, this process now takes a mere 0-5 minutes, representing an impressive average increase of 74.6% in efficiency.

Furthermore, the study revealed a significant uptick in the number of slips a single staff member can generate in a day, with one person now capable of processing 100-200 slips within a 24-hour period – an astounding 74.5% increase. This streamlined process has had a cascading effect, enabling more patients to be seen by doctors in a timely manner.

Another noteworthy improvement lies in the enhanced ability to assign patients to the appropriate departments, units, and wards for consultation, as this crucial information is now printed directly on the OPD slip. This development has alleviated confusion and facilitated smoother patient flow within the hospital.

Moreover, queue management has experienced a remarkable 70.9% improvement, enabling more effective crowd control and ensuring a more organized and less chaotic environment for patients and staff alike.

6.2. IPD Registration Counter:

At the IPD registration counter, the study unveiled equally impressive findings, with 56.7% of respondents acknowledging positive changes following digitalization. One of the most significant improvements observed by the workers at this desk is the substantial reduction in the time required to generate IPD

patient slips for admission. Post-digitalization, this process now takes a mere 0-15 minutes, representing an astonishing 89.8% decrease in processing time.

Additionally, the number of admission slips a single staff member can generate per day has seen a remarkable surge, with 0-150 persons now being processed within a 24-hour period – an average increase of 79.9%. This heightened efficiency has made it considerably easier for admission desk personnel to identify the appropriate department for admitting patients, resulting in an average improvement of 88.4%.

The discharge process from the wards has also undergone a substantial transformation, with the time required for this procedure decreasing to 0-20 minutes after digitalization – an impressive 82.5% reduction. This newfound efficiency has enabled a higher turnover rate, allowing more patients to be admitted to the wards in a timely manner.

Furthermore, the study revealed a decrease in the time required for ward and bed selection, alleviating a previously cumbersome process. Perhaps most notably, the feasibility of documenting daily patient notes has been greatly enhanced, reducing the burden of creating discharge summaries at the end of a patient's stay.

6.3. Central Laboratory:

The central laboratory, a critical component of any healthcare facility, has also reaped the rewards of digitalization, with 81.5% of respondents acknowledging

significant positive changes. One of the most notable improvements is the drastic reduction in the time required to generate reports, now taking a mere 0-2 minutes – an impressive 88.8% decrease, largely attributable to the integration of machines with the digital application.

Remarkably, a single staff member can now generate reports for an astounding 300-500+ patients within a minute, representing an average increase of 63% in efficiency. This technological advancement has also led to a substantial decrease in human error, a persistent challenge in healthcare settings.

Perhaps most crucially, patients can now access their reports remotely, eliminating the need for physical presence and enhancing convenience. The quick generation of reports and streamlined documentation processes have further contributed to the overall improvement in service delivery.

The study's comprehensive findings underscore the transformative power of digitalization within the SMS hospital, a phenomenon that has reverberated across multiple departments. The OPD registration counters, IPD registration counters, and central laboratory have all experienced remarkable enhancements in quality, efficiency, and patient satisfaction.

By embracing cutting-edge digital solutions, the SMS hospital has effectively addressed long-standing challenges, such as lengthy wait times, cumbersome administrative processes, and the potential for human error. The integration of technology has not only optimized workflows but has also fostered a more

patient-centric approach, ensuring a seamless and comfortable experience for those seeking medical care.

Furthermore, the study's findings have far-reaching implications that extend beyond the confines of the SMS hospital. They serve as a compelling testament to the vital role of digitalization in modernizing healthcare systems globally. As the world continues to grapple with the ever-increasing demand for efficient and accessible healthcare services, the successful implementation of digital solutions, as exemplified by this study, provides a roadmap for other healthcare institutions seeking to enhance their operations and deliver superior patient care.

In essence, this groundbreaking research has illuminated the vast potential of technology to revolutionize the healthcare landscape, paving the way for a future where seamless integration of digital applications becomes the norm rather than the exception. By harnessing the power of innovation and embracing the digital transformation, healthcare providers can aspire to achieve unprecedented levels of excellence, fostering a healthcare ecosystem that prioritizes quality, efficiency, and most importantly, the well-being of patients.

7. LIMITATIONS

1. This study only used percentage data rather than actual figures.

2. Factors like gender, age, and domicile of Rajasthan or not are not taken into consideration.

8. CONCLUSION

The study was conducted at Sawai Mann Singh medical college and Hospital (SMS), Jaipur, Rajasthan. The above results were collected based on a questionnaire and the responses of the workers working in the three departments respectively. Shows that there is a drastic change in quality improvement and time management seen after the digitalization in the following departments. It becomes easy for the people to generate the quick slip generation of the patient, which will be department specific and have all the details of the patient as well as of the department. It has also been that crowd and queue management systems became easy and effective. In the IPD slip generation counter the admission and discharge time of patients is being decreased which also increases the effectiveness of the department. It has also been seen that there is an increase in the bed management system and ward selection for a particular department for the patient. The discharge summary of the patient now can be quickly generated as it is been saved on the application on daily basis. In the central laboratory due to the integration of machines with the application it is observed that the report generation of the patient becomes easy and there is a decrease in human error. No one person can generate more than 500+ reports with accuracy. The patients can now access their reports even in the remote areas.

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