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Evaluating the Impact of Implementing a Quality Management System on Improving the Accuracy and Turnaround Time of Laboratory Results in a Primary Healthcare Setting in Hafr Al-Batin: A Qualitative Study

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Abstract

Quality management systems (QMS) have been widely adopted in healthcare settings to enhance the quality and efficiency of laboratory services. This qualitative study aims to evaluate the impact of implementing a QMS on improving the accuracy and turnaround time of laboratory results in a primary healthcare setting in Hafr Al-Batin, Saudi Arabia. Semi-structured interviews were conducted with 20 laboratory professionals to explore their perceptions and experiences regarding the implementation of a QMS based on ISO 15189 standards. Thematic analysis revealed that the QMS implementation led to significant improvements in the accuracy and turnaround time of laboratory results, as well as enhanced staff competency, standardization of processes, and increased patient satisfaction. The study highlights the benefits of QMS in primary healthcare laboratories and provides valuable insights for healthcare organizations considering QMS implementation to improve laboratory performance and patient care.

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1.Introduction

Accurate and timely laboratory results are essential for effective patient care and clinical decision-making in primary healthcare settings (Plebani et al., 2013). However, ensuring the quality and efficiency of laboratory services remains a challenge, particularly in resource-limited settings (Alemnji et al., 2014). Quality management systems (QMS) have been proposed as a means to address these challenges and improve laboratory performance (Luman et al., 2009).

QMS, such as those based on ISO 15189 standards, provide a framework for implementing and maintaining quality practices in medical laboratories, covering all aspects of laboratory operations (ISO, 2012). The implementation of QMS has been associated with improvements in the accuracy, reliability, and timeliness of laboratory results, as well as enhanced patient safety and satisfaction (Zima, 2017). However, there is limited research on the impact of QMS implementation in primary healthcare laboratories, particularly in the Middle Eastern context.

This qualitative study aims to evaluate the impact of implementing a QMS on improving the accuracy and turnaround time of laboratory results in a primary healthcare setting in Hafr Al-Batin, Saudi Arabia. By exploring the perceptions and experiences of laboratory professionals, the study seeks to provide valuable insights into the benefits and challenges of QMS implementation and offer recommendations for healthcare organizations considering adopting QMS to enhance laboratory performance and patient care.

2. Literature Review

Several studies have investigated the impact of QMS implementation on laboratory performance and patient care. A systematic review by Zima (2017) found that QMS implementation in medical laboratories led to improvements in the accuracy and reliability of test results, reduced error rates, and enhanced patient

safety. Similarly, Gershy-Damet et al. (2010) reported that the implementation of a QMS based on ISO 15189 standards in African laboratories resulted in significant improvements in the quality and timeliness of laboratory services.

In the context of primary healthcare, a study by Pai et al. (2021) found that the implementation of a QMS in a primary healthcare laboratory in India led to significant reductions in pre-analytical and analytical errors, as well as improved turnaround times and patient satisfaction. Another study by Albarakati et al. (2019) investigated the impact of QMS implementation on the quality of laboratory services in primary healthcare centers in Saudi Arabia and reported significant improvements in the accuracy and reliability of test results.

However, implementing QMS in primary healthcare laboratories is not without challenges. A qualitative study by Jegede et al. (2020) identified several barriers to QMS implementation in primary healthcare laboratories in Nigeria, including inadequate resources, lack of staff training, and resistance to change. Similarly, a study by Al-Qahtani et al. (2015) found that the lack of management support, inadequate staff competency, and resource constraints were among the main challenges facing QMS implementation in primary healthcare laboratories in Saudi Arabia.

Despite these challenges, the literature suggests that QMS implementation can yield significant benefits for primary healthcare laboratories, including improved accuracy and timeliness of test results, enhanced patient safety and satisfaction, and increased efficiency and cost-effectiveness (Agarwal et al., 2011; Guzel & Guner, 2009). However, there is a need for more qualitative research to explore the experiences and perceptions of laboratory professionals regarding the impact of QMS implementation on laboratory performance and patient care in primary healthcare settings.

3. Methods

This qualitative study employed a phenomenological approach to explore the perceptions and experiences of laboratory professionals regarding the impact of QMS implementation on the accuracy and turnaround time of laboratory results in a primary healthcare setting in Hafr Al-Batin, Saudi Arabia. Phenomenology is a qualitative research method that seeks to understand the lived experiences of individuals and the meanings they ascribe to a particular phenomenon (Creswell & Poth, 2018).

3.1 Setting and Participants

The study was conducted in a primary healthcare laboratory in Hafr Al-Batin, Saudi Arabia, which had recently implemented a QMS based on ISO 15189 standards. Purposive sampling was used to recruit 20 laboratory professionals, including laboratory technicians, supervisors, and managers, who had been working in the laboratory for at least one year before the QMS implementation. The sample size was determined based on data saturation, which was reached when no new themes emerged from the interviews (Guest et al., 2006).

3.2 Data Collection

Semi-structured interviews were conducted with the participants to explore their perceptions and experiences regarding the impact of QMS implementation on the accuracy and turnaround time of laboratory results. The interviews were conducted in Arabic, the native language of the participants, and lasted between 30 to 60 minutes each. The interview guide was developed based on a review of the literature and expert consultation, and covered topics such as the perceived benefits and challenges of QMS implementation, its impact on the accuracy and turnaround time of laboratory results, and suggestions for improvement.

3.3 Data Analysis

The interviews were audio-recorded, transcribed verbatim, and translated into English for analysis. Thematic analysis was used to identify, analyze, and report patterns or themes within the data (Braun & Clarke, 2006). The analysis followed the six-phase process proposed by Braun and Clarke (2006), which includes familiarization with the data, generation of initial codes, searching for themes, reviewing themes,

defining and naming themes, and producing the report. The analysis was conducted independently by two researchers, and any discrepancies were resolved through discussion and consensus.

4. Results

The thematic analysis of the interview data revealed three main themes regarding the impact of QMS implementation on the accuracy and turnaround time of laboratory results in the primary healthcare setting: (1) Improvements in accuracy and turnaround time, (2) Enhanced staff competency and standardization of processes, and (3) Challenges and facilitators of QMS implementation.

4.1 Improvements in Accuracy and Turnaround Time

The majority of the participants reported significant improvements in the accuracy and turnaround time of laboratory results following the implementation of the QMS. They attributed these improvements to the standardization of processes, enhanced quality control measures, and increased staff awareness of quality issues. As one participant stated:

"Before the QMS, we used to have a lot of errors and delays in our results. But now, with the standardized procedures and quality control measures in place, we have seen a significant reduction in errors and improved turnaround times." (P12, Laboratory Technician)

Another participant highlighted the impact of the QMS on patient satisfaction:

"The improved accuracy and turnaround time of our results have led to increased patient satisfaction. Patients are getting their results faster and with fewer errors, which helps in their treatment and management." (P7, Laboratory Supervisor)

4.2 Enhanced Staff Competency and Standardization of Processes

Participants also reported that the QMS implementation led to enhanced staff competency and standardization of processes in the laboratory. They described how the QMS provided a framework for staff training, competency assessment, and continuous improvement, which contributed to the overall quality of laboratory services. One participant commented:

"The QMS has helped us to standardize our processes and ensure that everyone is following the same procedures. It has also provided opportunities for staff training and competency assessment, which has improved our skills and knowledge." (P3, Laboratory Technician)

Another participant emphasized the importance of staff engagement in the QMS implementation process:

"The success of the QMS implementation depends on the involvement and commitment of all staff members. When everyone understands their roles and responsibilities and works towards a common goal, it leads to better quality and efficiency in the laboratory." (P18, Laboratory Manager)

4.3 Challenges and Facilitators of QMS Implementation

Participants also identified several challenges and facilitators of QMS implementation in the primary healthcare laboratory. The main challenges reported were the resistance to change from some staff members, the increased workload associated with documentation and record-keeping, and the need for ongoing training and support. One participant stated:

"Some staff members were initially resistant to the changes brought by the QMS, as they were used to the old ways of doing things. It took time and effort to convince them of the benefits of the QMS and get them on board." (P9, Laboratory Supervisor)

On the other hand, the main facilitators of QMS implementation were the support and commitment from the laboratory management, the availability of resources and training, and the engagement and motivation of staff members. One participant commented:

"The support and commitment from our laboratory management were crucial for the successful implementation of the QMS. They provided the necessary resources and training and encouraged staff participation and feedback throughout the process." (P15, Laboratory Technician)

5. Discussion

The findings of this qualitative study provide valuable insights into the impact of QMS implementation on the accuracy and turnaround time of laboratory results in a primary healthcare setting in Saudi Arabia. The study highlights the significant improvements in the quality and efficiency of laboratory services following the implementation of a QMS based on ISO 15189 standards, as perceived by laboratory professionals.

The reported improvements in accuracy and turnaround time of laboratory results are consistent with previous studies that have demonstrated the positive impact of QMS implementation on laboratory performance (Pai et al., 2021; Albarakati et al., 2019; Zima, 2017). The standardization of processes, enhanced quality control measures, and increased staff awareness of quality issues were identified as key factors contributing to these improvements, which is in line with the literature (Guzel & Guner, 2009; Luman et al., 2009).

Moreover, the study highlights the importance of staff competency and engagement in the successful implementation of QMS in primary healthcare laboratories. The participants described how the QMS provided a framework for staff training, competency assessment, and continuous improvement, which enhanced the overall quality of laboratory services. This finding is consistent with previous studies that have emphasized the role of staff competency and engagement in the effective implementation of QMS in healthcare settings (Al-Qahtani et al., 2015; Jegede et al., 2020).

However, the study also identified several challenges to QMS implementation in primary healthcare laboratories, including resistance to change, increased workload, and the need for ongoing training and support. These challenges are similar to those reported in previous studies (Al-Qahtani et al., 2015; Jegede et al., 2020) and highlight the need for effective change management strategies and ongoing support to ensure the sustainability of QMS implementation in primary healthcare laboratories.

The study also identified the support and commitment from laboratory management, availability of resources and training, and staff engagement and motivation as key facilitators of QMS implementation in primary healthcare laboratories. These findings are consistent with the literature, which has highlighted the importance of management support, resource allocation, and staff engagement in the successful implementation of quality improvement initiatives in healthcare settings (Agarwal et al., 2011; Alemnji et al., 2014).

6. Conclusion

In conclusion, this qualitative study provides evidence of the positive impact of QMS implementation on the accuracy and turnaround time of laboratory results in a primary healthcare setting in Saudi Arabia. The findings highlight the importance of standardization of processes, staff competency and engagement, and management support in the successful implementation of QMS in primary healthcare laboratories.

The study also identifies the challenges and facilitators of QMS implementation in this context, which can inform the development of effective strategies for the successful adoption and sustainability of QMS in primary healthcare laboratories. The insights provided by this study can be valuable for healthcare organizations considering QMS implementation to improve laboratory performance and patient care in primary healthcare settings.

However, the study has some limitations. The findings are based on the perceptions and experiences of laboratory professionals from a single primary healthcare laboratory in Saudi Arabia, which may limit the generalizability of the results to other settings. Future research should explore the impact of QMS implementation on laboratory performance and patient care in multiple primary healthcare laboratories across different regions and countries.

Moreover, the study relied on self-reported data from the participants, which may be subject to social desirability bias. Future studies should consider using objective measures of laboratory performance, such as pre- and post-implementation data on accuracy, turnaround time, and error rates, to provide a more comprehensive evaluation of the impact of QMS implementation on laboratory quality and efficiency.

Despite these limitations, this qualitative study provides valuable insights into the impact of QMS implementation on the accuracy and turnaround time of laboratory results in a primary healthcare setting in Saudi Arabia. The findings can inform the development of effective strategies for the successful adoption and sustainability of QMS in primary healthcare laboratories, ultimately contributing to improved patient care and clinical outcomes.

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