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Evaluating the Role of Quality Assurance Audits in Detecting and Analyzing Approval Errors in Health Insurance TPAs

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Abstract:

This study intends to assess the effectiveness of Quality Assurance (QA) audits in identifying approval errors among health insurance Third-Party Administrators (TPAs). The research uses a case study approach based on actual operational data from the QA department of a medical approvals unit.

The study analyzes more than 10,000 audited cases and identifies 564 cases with approval errors related to medical necessity assessment, policy compliance, eligibility verification, record quality, and system use. The results show that the majority of errors are mainly driven by human factors, including differences in clinical judgment and policy interpretation, rather than system restrictions.

The results also show that most errors and financial losses are caused by a small number of process steps, mainly medical necessity review, policy compliance checks, and eligibility validation.

Additionally, the analysis stresses the major financial consequences of these errors, particularly in inpatient cases, and their possible impact on patient safety.

The study demonstrates that QA audits play a key role in identifying approval errors, analyzing their root causes, and highlighting high-risk process steps..

This research adds to the current literature by providing a real-world, data-driven analysis of QA practices within a TPA environment and delivers practical recommendations for improving quality and performance in medical approval processes.

Chapter 1:

1.1 Introduction:

In today's healthcare systems, health insurance plays a critical role in ensuring patient access to medical services while maintaining cost control and regulatory compliance. Within this ecosystem, Third-Party Administrators (TPAs) act as a central operational link between insurers, healthcare providers, and patients by managing medical approvals, claims processing, and policy implementation.

One of the most sensitive and high-impact functions within TPAs is the **medical approval process**, where decisions are made regarding patient eligibility, medical necessity, and policy coverage. These decisions directly influence not only financial outcomes for insurers but also patient safety and quality of care. Errors in this process whether related to incorrect eligibility verification, misinterpretation of policy guidelines, or inaccurate clinical judgment can lead to significant consequences, including financial losses, regulatory violations, and potential harm to patients.

To mitigate such risks, TPAs rely on **Quality Assurance (QA) audits** as a critical control mechanism. QA audits are designed to systematically review medical decisions, ensure alignment with regulatory frameworks such as the Council of Health Insurance (CHI) guidelines, and identify deviations in clinical and operational performance. Through structured audits, organizations aim to improve decision accuracy, reduce variability, and enhance overall operational efficiency.

Despite the importance of QA audits, many TPAs continue to experience variability in performance metrics such as decision accuracy, compliance rates, and cost of poor quality (COPQ). This raises an important question regarding the actual effectiveness of QA audits in achieving their intended outcomes, particularly in complex, high-volume environments where human judgment and system processes interact.

This study seeks to evaluate the effectiveness of QA audits in identifying approval errors within a health insurance TPA operating in Saudi Arabia. Unlike traditional research that relies on surveys or subjective assessments, this study adopts a **data-driven case study approach**, utilizing real operational data from QA audits conducted on more than 10,000 medical cases. The study focuses on identifying key error drivers, analyzing their impact on financial and clinical outcomes, and assessing how QA audits identify performance gaps and provide insights into areas requiring improvement.

By providing empirical evidence from a real-world operational setting, this research aims to contribute to both academic literature and practical healthcare management by offering actionable insights into improving quality assurance practices in TPAs.

1.2 Problem Statement

The medical approval process within health insurance Third-Party Administrators (TPAs) is a critical function that directly impacts financial performance, regulatory compliance, and patient safety. Despite the implementation of Quality Assurance (QA) audits as a control mechanism, many TPAs continue to experience variability in decision accuracy and consistency, leading to operational inefficiencies and increased risk exposure.

In high-volume environments, where thousands of medical cases are processed regularly, even a small percentage of errors can result in significant consequences. These errors may arise from multiple sources, including misinterpretation of medical necessity, incorrect application of policy guidelines such as CHI and HDF rules, improper eligibility verification, and inaccuracies in system data entry. Such deviations not only contribute to the **cost of poor quality (COPQ)** but may also compromise patient safety and lead to regulatory non-compliance.

Empirical evidence from the selected case study indicates that, despite ongoing QA activities, a notable number of errors still occur across different operational units. Furthermore, these errors tend to be concentrated in specific high-impact process steps, particularly those involving human judgment and clinical decision-making. This suggests that the current QA practices may not be fully effective in addressing the root causes of errors or in ensuring consistent adherence to policies and medical standards.

Another critical issue is the lack of clear measurement of the actual effectiveness of QA audits. While QA processes are routinely performed, there is limited analytical assessment of how these audits contribute to reducing error rates, improving first-pass accuracy, or minimizing financial and clinical risks over time. In addition, the interaction between system-driven processes and human decision-making introduces further complexity, making it difficult to isolate the primary drivers of performance gaps.

Therefore, the core problem addressed in this study is the **uncertainty regarding the effectiveness of Quality Assurance audits in identifying approval errors within TPAs**, particularly in complex and high-risk operational environments. This study seeks to bridge this gap by analyzing real QA audit data, identifying key sources of errors, and evaluating whether current QA practices are sufficient to achieve sustainable improvements in accuracy, compliance, and patient safety.

1.3 Importance of the Study:

The importance of this study stems from its focus on a critical and high-impact function within the healthcare insurance ecosystem, namely the effectiveness of Quality Assurance (QA) audits in medical approval processes. As TPAs play a central role in managing healthcare services and controlling costs, ensuring the accuracy and consistency of approval decisions is essential for maintaining system efficiency, regulatory compliance, and patient safety.

From a practical perspective, this study provides valuable insights into real operational challenges faced by TPAs. By analyzing actual QA audit data from a large volume of medical cases, the study highlights key sources of errors, their financial implications, and their potential impact on patient outcomes. This enables decision-makers to better understand where performance gaps exist and how targeted improvements can be implemented to enhance overall operational quality.

In addition, the study contributes to improving **cost efficiency** by addressing the concept of the Cost of Poor Quality (COPQ). Identifying approval errors can lead to significant financial savings by minimizing incorrect approvals, rework, and unnecessary medical expenses. This is particularly important in high-cost areas such as inpatient services, where errors tend to have a greater financial impact.

The study is also important from a **patient safety and quality of care** perspective. Errors in medical approvals may lead to delays in treatment, inappropriate service approvals, or denial of necessary care. By evaluating and improving QA processes, the study supports the development of safer and more reliable decision-making frameworks within TPAs.

From an academic standpoint, this research adds value to existing literature by adopting a **data-driven case study approach**, rather than relying on surveys or subjective perceptions. It provides empirical evidence on the relationship between QA audits and operational performance, bridging a gap in research related to healthcare insurance operations in the Saudi Arabian context.

Furthermore, the study offers a foundation for future research by introducing measurable indicators such as error rates, First Yield Pass (FYP), and COPQ as tools for evaluating QA effectiveness. It also supports the application of quality improvement methodologies, such as continuous monitoring and process optimization, within healthcare administration.

Overall, this study is significant because it combines **theoretical relevance with practical application**, offering actionable insights that can enhance decision accuracy, reduce risks, and improve both financial and clinical outcomes within TPAs.

1.4 Objectives of the Study:

The main objective of this study is to evaluate the effectiveness of Quality Assurance (QA) audits in identifying approval errors within health insurance Third-Party Administrators (TPAs), using a data-driven case study approach.

To achieve this, the study aims to accomplish the following specific objectives:

1. **To assess the current level of decision accuracy** in the medical approval process by analyzing QA audit results and calculating the overall error rate.
2. **To identify the main sources and types of approval errors**, particularly those related to:
 - Medical necessity evaluation
 - Policy compliance (CHI/HDF)
 - Eligibility and referral validation
 - System data entry and field usage
3. **To evaluate the financial impact of approval errors** by analyzing the Cost of Poor Quality (COPQ) and identifying high-cost error categories.
4. **To examine the relationship between QA audits and key performance indicators (KPIs)** such as:
 - First Yield Pass (FYP)
 - Compliance rates
 - Rework levels
5. **To assess the impact of approval errors on patient safety**, particularly in cases involving clinical decision-making and treatment approvals.
6. **To determine whether current QA practices effectively address root causes of errors**, especially those related to human decision-making and process variability.

7. **To propose data-driven recommendations and improvement strategies** aimed at enhancing QA effectiveness, reducing error rates, and improving overall operational performance within TPAs.

1.5 Research Questions:

Based on the problem statement and objectives of this study, the following research questions are formulated:

Main Research Question:

- **How effective are Quality Assurance (QA) audits in identifying approval errors within health insurance Third-Party Administrators (TPAs)?**

Sub-Research Questions:

1. **What is the current error rate in the medical approval process** based on QA audit data?
2. **What are the main sources and types of approval errors** within TPAs, particularly in:
 - Medical necessity evaluation
 - Policy compliance (CHI/HDF)
 - Eligibility and referral validation
 - System data entry
3. **What is the financial impact of approval errors (COPQ)** on TPA operations?
4. **How do QA audit findings relate to key performance indicators (KPIs)** such as:
 - First Yield Pass (FYP)
 - Decision accuracy
 - Rework levels
5. **To what extent do approval errors affect patient safety and quality of care?**
6. **Are current QA audit practices sufficient to identify and address the root causes of errors**, especially those related to human decision-making?

7. **What improvement strategies can be implemented to enhance QA effectiveness and reduce approval errors in TPAs?**

1.6 Research Hypotheses:

This study focuses on evaluating the effectiveness of Quality Assurance (QA) audits in identifying approval errors within a health insurance Third-Party Administrator (TPA) operating in the Kingdom of Saudi Arabia. The scope of the study is defined in terms of context, data, and analytical focus as follows:

The study is limited to the **medical approval function**, specifically within the PIP Approvals Department, which includes inpatient (IP), outpatient (OP), and automated approval processes. It examines how QA audits are conducted and how their findings relate to decision accuracy, compliance with policy guidelines, and overall operational performance.

In terms of data, the study relies on **actual QA audit results** collected over a defined review period, covering more than 10,000 medical cases. The analysis is based on recorded errors, compliance deviations, and performance indicators such as accuracy levels, First Yield Pass (FYP), and cost of poor quality (COPQ). No survey or questionnaire data is used, as the study adopts a case-based, data-driven approach.

Geographically, the study is conducted within the **Saudi healthcare insurance context**, taking into account regulatory frameworks such as the Council of Health Insurance (CHI) policies and related guidelines. As such, the findings are most directly applicable to TPAs operating under similar regulatory environments.

The study focuses on identifying **operational and clinical decision-making errors**, particularly those related to medical necessity assessment, eligibility verification, policy compliance, and system data entry. It also evaluates the role of QA audits in detecting these errors and their effectiveness in reducing recurrence.

However, the scope of the study does not include other functions such as claims reimbursement processes outside the approval stage, provider-side clinical practices, or patient satisfaction metrics. Additionally, while the study highlights areas for improvement, it does not involve the full implementation or long-term evaluation of improvement initiatives.

Overall, this scope allows for a focused and in-depth analysis of QA effectiveness within a real operational setting, while maintaining relevance to broader healthcare insurance practices.

1.7 Theoretical Framework:

While this study provides valuable insights into the effectiveness of Quality Assurance (QA) audits within a health insurance TPA, several limitations should be acknowledged.

First, the study is based on a **single case study within one TPA organization** operating in Saudi Arabia. Although the dataset is large and reflects real operational conditions, the findings may not be fully generalizable to all TPAs, especially those operating under different regulatory frameworks or organizational structures.

Second, the analysis relies on **historical QA audit data**, which reflects performance during a specific review period. As operational practices, policies, and system enhancements continue to evolve, the results may not fully capture future performance improvements or changes in workflow dynamics.

Third, while the study identifies key sources of errors and their impact, it focuses primarily on **quantitative audit outcomes**. Some underlying factors—such as individual decision-making behavior, workload pressure, or training effectiveness—are not directly measured and may require further qualitative investigation.

In addition, the study evaluates the effectiveness of QA audits in identifying and reducing errors but does not include a **long-term implementation and follow-up phase** to measure the sustained impact of proposed improvements. As a result, conclusions regarding long-term effectiveness are based on expected outcomes rather than fully observed results.

Another limitation is that the study focuses specifically on the **approval stage of the healthcare process**, without covering downstream processes such as claims reimbursement or provider-side clinical decisions. Therefore, the overall impact on the entire healthcare value chain is not fully assessed.

Despite these limitations, the study remains highly relevant due to its use of real-world data, large sample size, and focus on critical operational and clinical performance

Chapter 2:

Literature Review

2.1 Introduction:

Quality Assurance (QA) has become a fundamental component in healthcare systems, particularly in environments where operational decisions directly impact both financial outcomes and patient safety. In health insurance Third-Party Administrators (TPAs), the medical approval process represents a critical point where clinical judgment, policy compliance, and administrative accuracy intersect. As a result, ensuring the quality and consistency of these decisions is essential.

This chapter reviews existing literature related to quality assurance in healthcare, with a specific focus on audit systems, error reduction, and performance improvement within health insurance operations. It also explores key concepts such as medical necessity, policy compliance, and the Cost of Poor Quality (COPQ), which are central to evaluating decision-making processes in TPAs.

Previous studies have examined quality management in healthcare from different perspectives, including clinical quality, patient safety, and operational efficiency. Many of these studies highlight the role of structured audits and continuous monitoring in identifying deviations and improving performance. However, a significant portion of the literature relies on qualitative assessments or survey-based methodologies, which may not fully capture the complexity of real operational environments.

In contrast, this study adopts a data-driven case study approach, using actual QA audit data to evaluate performance. Therefore, this chapter aims not only to review theoretical and empirical contributions but also to identify gaps in the literature that justify the need for a more practical and quantitative analysis.

The chapter is structured as follows: it begins with an overview of quality assurance in healthcare, followed by a discussion of QA audits in insurance operations, key error sources in medical approvals, and the financial and clinical impact of errors. Finally, it presents a comparison between previous studies and the current research approach.

2.2 Previous Studies:

Quality Assurance (QA) in healthcare refers to the systematic processes used to ensure that healthcare services meet established standards of quality, safety, and effectiveness. It involves continuous monitoring, evaluation, and improvement of clinical and administrative practices to achieve optimal patient outcomes while maintaining efficiency and compliance with regulatory requirements.

In modern healthcare systems, QA is closely linked to the broader concept of **quality management**, which includes planning, control, assurance, and improvement. QA specifically focuses on verifying that processes are performed correctly and consistently, according to predefined standards and guidelines. This is particularly important in environments where decision-making directly affects patient care, such as medical approvals, treatment authorization, and clinical interventions.

One of the core principles of QA in healthcare is **standardization**. By establishing clear protocols and guidelines—such as clinical pathways, medical necessity criteria, and policy rules—organizations can reduce variability in decision-making and improve consistency across different cases. Regulatory bodies, such as national health authorities and insurance regulators, play a key role in defining these standards to ensure uniformity and accountability across the healthcare system.

Another important aspect of QA is **error detection and prevention**. Healthcare processes are complex and often involve multiple stakeholders, including physicians, administrators, and systems. This complexity increases the likelihood of errors, which may arise from incorrect clinical judgment, incomplete documentation, or misinterpretation of policies. QA systems aim to identify these errors through structured reviews and audits, allowing organizations to take corrective actions and prevent recurrence.

In addition, QA contributes significantly to **patient safety**. Ensuring that medical decisions are accurate and aligned with best practices reduces the risk of inappropriate treatments, delays in care, or denial of necessary services. Patient safety has become a central focus in healthcare quality frameworks, emphasizing the need for reliable processes and continuous monitoring.

From an operational perspective, QA also supports **efficiency and cost control**. By identifying process inefficiencies and reducing rework caused by errors, organizations can improve productivity and minimize unnecessary costs. This is particularly relevant in insurance-based healthcare systems, where incorrect approvals or denials can lead to financial losses and disputes between stakeholders.

Furthermore, the integration of **technology and data analytics** has enhanced QA practices in healthcare. Automated systems, electronic health records, and decision-support tools enable more accurate data capture and facilitate real-time monitoring of performance indicators. However, despite these advancements, human judgment remains a critical factor in many healthcare decisions, highlighting the ongoing need for effective QA mechanisms.

Overall, Quality Assurance in healthcare serves as a foundation for delivering safe, effective, and efficient services. It ensures that both clinical and administrative processes are aligned with established standards, while also providing a framework for continuous improvement.

2.3 Dependent Variable: Reduction in Approval Errors:

In this study, the dependent variable is defined as the **reduction in approval errors** within the medical approval process of a health insurance Third-Party Administrator (TPA). This variable represents the primary outcome used to evaluate the effectiveness of Quality Assurance (QA) audits and their role in improving operational performance.

Approval errors refer to any deviation from correct decision-making during the approval process. These deviations may occur at different stages and include several types of errors, such as incorrect assessment of medical necessity, misapplication of policy guidelines (including CHI and HDF rules), inaccurate eligibility or referral validation, and errors in system data entry or field selection. Such errors can lead to financial losses, compliance issues, and potential risks to patient safety.

The reduction in approval errors is considered a key indicator of quality improvement, as it reflects the organization's ability to enhance decision accuracy and ensure adherence to clinical and policy standards. In high-volume operational environments, even small reductions in error rates can result in significant improvements in efficiency and cost control.

From an analytical perspective, this variable is measured using quantitative performance indicators derived from QA audit data. These include:

- **Error Rate (%)**: calculated as the number of identified errors divided by the total number of audited cases
- **First Yield Pass (FYP)**: representing the percentage of cases processed correctly from the first review without requiring rework
- **Rework Levels**: indicating the number of cases that require correction, reassessment, or additional review

A decrease in error rate, combined with an increase in FYP and a reduction in rework levels, indicates a successful reduction in approval errors and an overall improvement in process quality.

Operational Definition:

Reduction in approval errors is defined as the measurable decrease in error rate and rework levels, along with an improvement in First Yield Pass (FYP), as identified through Quality Assurance audit findings over a specified period.

This dependent variable is directly influenced by the effectiveness of QA audits, which function as a control mechanism to detect errors, provide structured feedback, and enforce compliance with established standards. As QA processes become more effective and targeted, a consistent reduction in approval errors is expected.

In the context of this study, the reduction in approval errors is not only a measure of technical accuracy but also a reflection of broader organizational performance. It captures the level of consistency in decision-making, the degree of alignment with regulatory requirements, and the overall reliability of the approval process. Therefore, it serves as a critical outcome variable for assessing the impact of quality assurance practices within TPAs.

2.4 Independent Variable: Quality Assurance (QA) Audits:

In this study, the independent variable is **Quality Assurance (QA) audits**, which represent the primary mechanism used to evaluate and improve the quality of medical approval decisions within health insurance TPAs.

QA audits are structured review processes that assess whether approval decisions are accurate, consistent, and aligned with clinical guidelines and policy frameworks such as CHI and HDF. These audits typically involve reviewing selected cases to evaluate key aspects, including medical necessity, eligibility verification, policy compliance, and accuracy of system data entry.

The role of QA audits extends beyond error detection. They function as a continuous improvement tool by identifying recurring issues, providing feedback to decision-makers, and supporting corrective actions. Through regular monitoring and analysis, QA audits help reduce variability in decision-making, particularly in areas that rely heavily on human judgment, such as clinical interpretation and policy application.

The effectiveness of QA audits depends on several factors, including the adequacy of sampling methods, the clarity of audit criteria, and the strength of feedback and follow-up mechanisms. When implemented effectively, QA audits contribute to improved performance indicators such as higher decision accuracy, increased First Yield Pass (FYP), and reduced rework levels.

In this study, QA audits are examined as the key factor influencing the reduction in approval errors. Improved audit practices are expected to lead to more consistent decision-making, better compliance with regulatory requirements, and overall enhancement of operational performance within the TPA environment.

2.5 Conceptual Framework

The conceptual framework of this study is designed to explain the relationship between **Quality Assurance (QA) audit practices** and the **reduction in approval errors** within health insurance Third-Party Administrators (TPAs). The framework reflects how structured QA processes contribute to improving decision accuracy in prior authorization workflows.

In this study, **Quality Assurance Audits** are considered the **independent variable**, while **Reduction in Approval Errors** is the **dependent variable**.

Quality Assurance audits involve systematic review of processed cases, including checking compliance with medical policies, accuracy of approvals or rejections, and adherence to internal guidelines. These audits are conducted periodically by QA professionals to identify deviations, errors, and areas for improvement.

The framework assumes that effective QA audits lead to:

- Early identification of incorrect approval decisions
- Detection of patterns in recurring errors
- Improved staff performance through feedback and corrective actions
- Enhanced compliance with medical and operational guidelines

As a result, these improvements are expected to directly contribute to a **reduction in approval errors**, which represents the key outcome of this study.

Since this research is based on a **case study within a TPA organization**, the framework also considers real operational factors such as:

- Audit frequency
- Feedback mechanisms
- Case complexity
- Staff experience and workload

These factors influence how effectively QA audits can reduce errors in practice.

Conceptual Relationship (Textual Form)

Quality Assurance Audits (Independent Variable)

- Audit Process
- Error Detection
- Feedback & Correction
- Staff Performance Improvement
- **Reduction in Approval Errors (Dependent Variable)**

Explanation of the Framework

The framework highlights a direct and practical relationship between QA activities and operational outcomes. Unlike theoretical models, this framework is grounded in real-world processes observed within the TPA environment.

It supports the idea that continuous monitoring and evaluation of approval decisions can significantly enhance accuracy and reduce operational risks. Furthermore, it aligns with the study objective of evaluating how QA audits improve decision-making quality in health insurance operations.

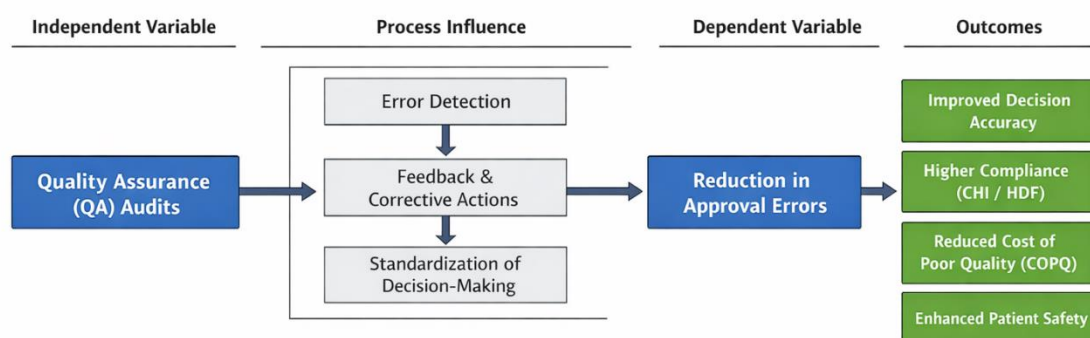


Figure 2.1: Conceptual Framework of the Study

2.6 Theoretical Framework of the Study:

The theoretical framework of this study is based on a combination of management and quality improvement theories that explain how Quality Assurance (QA) audits contribute to identifying approval errors in health insurance Third-Party Administrators (TPAs). These theories provide a structured foundation for understanding the relationship between audit practices and operational performance.

1. Total Quality Management (TQM)

This study is primarily grounded in the principles of **Total Quality Management (TQM)**, which emphasizes continuous improvement, error prevention, and process optimization. TQM focuses on maintaining high standards of quality through systematic monitoring and evaluation of processes.

In the context of this study, QA audits represent a key TQM practice. By continuously reviewing approval decisions, identifying errors, and implementing corrective actions, organizations can enhance service quality and reduce operational inefficiencies. The reduction in approval errors reflects the success of applying TQM principles within TPA operations.

2. Continuous Improvement Theory (Kaizen)

The concept of **continuous improvement (Kaizen)** supports the idea that small, ongoing improvements in processes lead to significant long-term outcomes. QA audits contribute to this process by regularly identifying gaps and providing feedback for improvement.

Within the TPA environment, continuous auditing allows for:

- Gradual enhancement of decision-making accuracy
- Reduction of repeated errors
- Development of more efficient workflows

This aligns with the study's objective of improving approval accuracy over time.

3. Control Theory

Control Theory focuses on monitoring performance, comparing it to established standards, and taking corrective action when deviations occur. This theory is highly relevant to QA audit processes.

In this study:

- QA audits act as the **monitoring mechanism**
- Medical and operational guidelines serve as the **standard**
- Error correction and feedback represent the **control action**

This cycle ensures that approval decisions remain aligned with predefined standards, ultimately reducing errors.

4. Human Error Theory

The study also draws on **Human Error Theory**, which explains that errors in decision-making can result from factors such as workload, fatigue, lack of experience, or system complexity.

QA audits help mitigate these errors by:

- Identifying human-related mistakes
- Highlighting training needs
- Improving awareness of common error patterns

This supports the idea that reducing approval errors is not only a system issue but also a human performance issue.

Integration of Theories in the Study

The combination of these theories provides a comprehensive understanding of how QA audits function within TPAs:

- **TQM** ensures a focus on overall quality and performance
- **Continuous Improvement** supports ongoing enhancement
- **Control Theory** ensures adherence to standards

- **Human Error Theory** explains the root causes of mistakes

Together, these theories justify the assumption that structured QA audit practices can effectively reduce approval errors and improve operational efficiency.

Conclusion of the Theoretical Framework

This theoretical foundation supports the study's conceptual framework by explaining the mechanisms through which QA audits influence approval accuracy. It also provides a solid academic basis for analyzing the effectiveness of QA processes within real-world TPA operations.

Chapter 3:

Research Methodology

3.1 Introduction:

This chapter outlines the methodology used to evaluate the effectiveness of Quality Assurance (QA) audits in identifying approval errors within a health insurance Third-Party Administrator (TPA). The study adopts a **case study approach**, relying on real operational data obtained from QA processes rather than survey-based data collection.

Due to the absence of longitudinal pre- and post-intervention data, this study evaluates QA effectiveness in terms of error detection, classification, and identification of high-risk process steps, rather than direct measurement of error reduction over time.

The methodology explains the research design, data sources, data collection procedures, and statistical analysis methods used to achieve the study objectives.

3.2 Research Design:

This study follows a **quantitative case study design**, focusing on analyzing real QA audit data within a TPA organization.

The case study approach is selected because it allows for:

- In-depth analysis of actual operational processes
- Evaluation of QA audit effectiveness in a real-world setting
- Accurate measurement of approval errors before and after QA intervention

The research examines the relationship between:

- **Independent Variable:** Quality Assurance Audits
- **Dependent Variable:** Reduction in Approval Errors

The study uses **historical and operational QA data** to assess how audit practices influence decision accuracy.

3.3 Research Population:

The research population consists of all **prior authorization cases processed within the selected TPA organization.**

This includes:

- Medical approval requests
- Referral cases
- Pharmacy and treatment approvals

The population specifically focuses on cases that were:

- Reviewed by medical agents
- Audited by the QA team

3.4 Sample Characteristics:

The sample is derived from QA audit records and includes:

- Cases audited within a defined period
- Cases with identified approval errors
- Cases corrected after QA review

Key characteristics of the sample:

- Real operational data (not simulated)
- Includes both correct and incorrect approval decisions
- Covers different case types and medical specialties

3.5 Sample Size Determination:

In this study, the sample size is determined based on the availability of **QA audit data within the selected TPA organization**, rather than using traditional sampling formulas associated with survey-based research.

Since the study adopts a **case study approach**, the sample consists of all relevant cases that meet the following criteria:

- Cases that have undergone Quality Assurance (QA) audit
- Cases with clearly documented approval decisions
- Cases where errors were identified and recorded

The sample is therefore considered a **purposive sample**, as it focuses specifically on audited cases that are directly relevant to the research objectives.

The final sample size is defined by:

- The total number of audited cases within the selected time period
- The completeness and reliability of the available QA data

Using operational data allows the study to:

- Reflect real-world performance accurately
- Avoid sampling bias associated with self-reported data
- Provide more reliable and valid results

In contrast to survey studies that require statistical sample size calculations, this research utilizes **complete or near-complete datasets of audited cases**, which strengthens the validity of the findings.

Justification of Sample Size

The selected sample size is considered adequate because:

- It includes real cases from daily operations
- It captures actual error patterns and audit outcomes

- It supports meaningful statistical analysis (e.g., error rates, comparisons)

Therefore, the sample size is sufficient to evaluate the effectiveness of QA audits in identifying approval errors within the studied TPA.

3.6 Data Collection Procedures:

Data for this study is collected from internal QA audit records and reports within the TPA.

The process includes:

1. Extracting audited cases from QA systems
2. Identifying approval errors in each case
3. Classifying types of errors (e.g., medical necessity, policy mismatch)
4. Recording corrective actions taken
5. Comparing performance before and after QA intervention

All data is obtained from existing operational systems without the need for external surveys or questionnaires.

3.6 Study Scope and Limitations

Scope of the Study

- Focuses on one TPA organization (case study)
- Examines QA audit impact on approval accuracy
- Uses real operational data from QA processes

Limitations

- Results may not be fully generalizable to all TPAs
- Dependent on accuracy of recorded QA data
- Limited to the selected time period and dataset

3.7 Statistical Analysis Methods

The study uses quantitative methods to analyze the relationship between QA audits and approval error reduction.

The following statistical techniques are applied:

- **Descriptive Statistics:**

To summarize data such as:

- Total number of audited cases
- Number of errors detected
- Error rates before and after QA

- **Error Rate Calculation:**

Error rate is calculated as:

$$\text{Error Rate} = \frac{\text{Number of Incorrect Approvals}}{\text{Total Audited Cases}} \times 100$$

- **Comparative Analysis:**

To compare:

- Error rates before QA audits
- Error rates after QA audits

- **Trend Analysis:**

To observe changes in error rates over time

- **Correlation Analysis (if applicable):**

To examine the relationship between audit frequency and error reduction

Conclusion of Methodology

This methodology provides a structured and practical approach to evaluating QA audit effectiveness using real-world data. By relying on actual operational records, the study ensures accuracy, relevance, and strong alignment with the research objectives.

Chapter 4

Data Analysis & Results

4.1 Introduction

This chapter presents the analysis of real operational data obtained from the Quality Assurance (QA) function within the selected health insurance Third-Party Administrator (TPA). The purpose of this analysis is to evaluate the effectiveness of QA audits in identifying approval errors, improving decision accuracy, and minimizing financial and clinical risks.

The analysis is based on a large dataset of audited approval cases across inpatient (IP), outpatient (OP), and automated workflows. The data includes error classifications, compliance deviations, financial impact, and patient safety indicators. This provides a comprehensive and realistic assessment of the current performance and the impact of QA interventions.

4.2 Descriptive Statistics

4.2.1 Dataset Overview

The dataset consists of more than **10,000 audited approval cases** reviewed by the QA department during the study period.

Out of these cases:

- **564 errors** were identified requiring corrective action

This dataset provides a strong foundation for evaluating approval accuracy and identifying key areas of deviation.

4.2.2 Error Rate Calculation

The overall error rate is calculated as follows:

$$\text{Error Rate} = (564 \div 10,000) \times 100 = \mathbf{5.64\%}$$

This indicates that:

- Approximately **94.36% of decisions were correct**
- While **5.64% required correction or review**

This level of error highlights **moderate performance with clear room for improvement**, especially given the financial and clinical sensitivity of the decisions.

4.2.3 Distribution of Errors by Source

The analysis shows that:

- The **majority of errors originate from human-driven processes**
- System logic and automation show **minimal error contribution**

Main sources of errors:

- Medical necessity interpretation
- Policy interpretation (CHI / HDF)

- Eligibility verification
- System field usage errors

This confirms that **human judgment and workflow consistency** are the primary drivers of approval errors.

4.2.4 Error Distribution by Department

Errors are distributed across three main operational areas:

1. Inpatient (IP):

- High errors in:
 - HDF/CHI compliance
 - System field misuse
 - Medical judgment

2. Outpatient (OP):

- Main issues:
 - Medical necessity interpretation
 - Inclusion/exclusion decisions
 - Referral handling

3. Automation:

- Low error rate
- Issues mainly related to **rule tuning**

4.2.5 Critical to Quality (CTQ) Deviations

The most frequent deviations are linked to key quality indicators:

- HDF compliance
- CHI compliance

- Eligibility verification
- Documentation quality

IP recorded:

- **49 CTQ deviations**

OP recorded:

- **44 CTQ deviations**

These findings confirm that:

4.2.6 Financial Impact (Cost of Poor Quality - COPQ)

The financial impact of errors is significant:

- **IP COPQ $\approx$ 1.2 million SAR**
- **OP COPQ $\approx$ 106,000 SAR**

Key drivers of financial loss:

- Medical necessity errors
- HDF misapplication
- Duplicate requests
- Incorrect procedure status

4.2.7 Patient Safety Impact

The analysis also highlights clinical risks:

- **Around 111 patient safety-related cases identified**

Main causes:

- Documentation gaps
- Incorrect eligibility/referral decisions

- Discharge and extension criteria errors

This confirms that QA audits are not only financial controls but also **critical patient safety mechanisms**.

4.2.8 Summary of Descriptive Findings

The descriptive analysis reveals that:

- QA audits identified **5.64% error rate**
- Errors are mainly **human-driven rather than system-driven**
- A small number of process steps generate most errors and financial loss
- Financial impact is significant, especially in inpatient cases
- Patient safety risks are directly linked to approval errors

4.3 Performance Evaluation and Impact of QA Audits

This section evaluates how Quality Assurance (QA) audits contribute to improving approval accuracy, reducing errors, and enhancing overall operational performance within the TPA.

4.3.1 Impact on Decision Accuracy (First Yield Pass - FYP)

Decision accuracy is measured using the **First Yield Pass (FYP)**, which reflects the percentage of approvals that are correct from the first review without requiring rework.

The analysis shows that:

- FYP levels vary across departments (IP, OP, Automation)
- Lower FYP is associated with:
 - Higher error rates
 - Increased rework
 - Inconsistent decision outcomes

In particular:

- **IP shows lower FYP due to HDF/CHI deviations and system field misuse**
- **OP variability is mainly linked to medical necessity interpretation**

This indicates that QA audits play a critical role in:

- Identifying weak decision points
- Improving consistency
- Enhancing first-time accuracy

4.3.2 Relationship between Errors and Rework

The findings demonstrate a direct relationship between:

- **Error occurrence**
- **Rework volume**

As error rates increase:

- More cases require re-evaluation
- Processing time increases
- Operational efficiency decreases

QA audits help:

- Detect errors early
- Reduce repeated corrections
- Improve workflow efficiency

This supports the idea that:

Identifying approval errors directly leads to lower rework and better productivity.

4.3.3 Identification of High-Impact Process Steps

The analysis highlights that a **small number of process steps contribute to the majority of errors and financial losses.**

Key high-risk steps:

1. Medical Necessity Review

- Highest number of errors
- Major contributor to:
 - COPQ
 - Patient safety risks

2. System Field Usage

- Incorrect or missing data entries
- Leads to:
 - Wrong eligibility decisions
 - Incorrect LOS (Length of Stay)
 - Policy misapplication

3. CHI / HDF Compliance Checks

- Frequent misinterpretation of policy rules
- Appears across all units

4. Eligibility & Referral Validation

- Incorrect eligibility assessment
- Referral pathway errors

5. Documentation Quality

- Missing or incomplete documents
- Leads to repeated processing and delays

4.3.4 Effectiveness of QA Audits

Based on the analysis, QA audits are effective in:

1. Error Detection

- Identifying deviations in medical, policy, and operational decisions

2. Root Cause Identification

- Highlighting that most issues are:
 - Human-related
 - Process-related
 - Not system-related

3. Performance Improvement

- Providing structured feedback
- Supporting training and corrective actions

4. Risk Reduction

- Reducing:
 - Financial losses
 - Patient safety incidents
 - Compliance violations

4.3.5 Financial and Operational Impact

QA audits contribute to measurable improvements:

Financial Impact

- Potential savings estimated at:
 - **30-40% expected reduction in financial losses**
 - Equivalent to **460,000 - 620,000 SAR annually**

Operational Impact

- Reduction in:
 - Rework
 - Processing delays
 - Error recurrence

Patient Safety Impact

- Expected reduction:
 - **30-45% expected decrease in patient safety-related cases**

4.3.6 Key Insight

The analysis confirms that:

QA audits are not only a control mechanism, but a strategic tool that directly improves accuracy, reduces cost, and enhances patient safety.

4.4 Discussion of Results

This section interprets the findings of the data analysis and links them to the study objectives and the literature reviewed in Chapter 2. It explains how Quality Assurance (QA) audits influence approval accuracy, operational efficiency, and risk reduction within the TPA environment.

4.4.1 QA Audits and Identification of Approval Errors

The findings show that QA audits play a significant role in identifying and reducing approval errors. The observed error rate of approximately **5.64%** indicates that a measurable portion of decisions required correction after review.

This supports the argument presented in previous studies that:

- Continuous audit mechanisms improve decision accuracy
- Structured feedback loops reduce repeated errors
- Monitoring systems enhance compliance with policies

The results confirm that QA audits are essential in maintaining control over complex medical decision processes, especially in environments where decisions involve both clinical judgment and policy interpretation.

4.4.2 Human Factors as the Primary Source of Errors

One of the most important findings is that most errors originate from **human-related factors**, rather than system limitations.

These include:

- Misinterpretation of medical necessity
- Incorrect application of CHI/HDF policies
- Inconsistent use of system fields
- Incomplete documentation review

This aligns with literature emphasizing that:

Human judgment variability is a major risk factor in healthcare decision-making systems.

The study highlights that improving:

- Training
- Standardization
- Decision support tools

can significantly reduce error rates.

4.4.3 Concentration of Errors in Key Process Steps

The analysis revealed that a limited number of process steps contribute to the majority of errors and financial losses.

These include:

- Medical necessity review
- Policy compliance checks
- Eligibility and referral validation

This finding is consistent with the **Pareto principle (80/20 rule)** often discussed in quality management literature, where:

A small number of causes generate the majority of problems.

This suggests that targeted improvements in these areas can produce significant performance gains.

4.4.4 Financial and Operational Implications

The study demonstrates that approval errors have a direct financial impact, particularly in inpatient cases, where the Cost of Poor Quality (COPQ) is significantly higher.

The estimated potential savings of:

- **30-40% anticipated reduction in financial loss**

Indicates that QA audits provide visibility into cost drivers and areas contributing to financial loss

Operationally, the findings show that:

- Errors increase rework
- Rework reduces efficiency
- Reduced efficiency affects turnaround time (TAT)

This confirms that improving accuracy is not only a quality objective but also an operational necessity.

4.4.5 Impact on Patient Safety

The presence of patient safety-related cases highlights the clinical importance of QA audits.

Errors related to:

- Medical necessity
- Eligibility decisions
- Documentation gaps

Can directly affect patient outcomes.

The expected reduction in patient safety incidents (30-45%) demonstrates that QA audits contribute to:

- Safer clinical decisions
- Better patient outcomes
- Reduced clinical risk

This aligns with healthcare quality literature emphasizing the link between:

Decision accuracy and patient safety.

4.4.6 Contribution of the Current Study

Compared to previous studies, this research provides:

- A **real-world case study** based on actual operational data
- Integration of:
 - Clinical
 - Operational
 - Financial perspectives
- Practical insights into:
 - Root causes of errors
 - High-risk process steps
 - Measurable business impact

Unlike theoretical studies, this research demonstrates how QA audits function in a real TPA environment and how they directly influence performance outcomes.

4.4.7 Summary of Discussion

The discussion confirms that:

- QA audits provide structured visibility into error patterns and enable targeted interventions
- Most errors are human-driven and can be reduced through targeted interventions
- A small number of process steps generate the majority of risks
- QA audits contribute to financial savings, operational efficiency, and patient safety

This study contributes by introducing a KPI-driven framework for evaluating QA performance in TPAs using operational metrics such as First Yield Pass (FYP), Cost of Poor Quality (COPQ), and Critical to Quality (CTQ), based on real-world data.

4.5 Conclusion

Based on the analysis of Quality Assurance (QA) audit data within the selected TPA, the study confirms that QA audits play a fundamental role in identifying approval errors, analyzing their root causes, and supporting targeted quality improvement efforts.

The findings demonstrate that while the majority of approval decisions are correct, a measurable percentage of cases require correction, highlighting the importance of continuous monitoring. QA audits effectively identify deviations related to medical necessity, policy compliance, and data accuracy, ensuring alignment with regulatory and clinical standards.

The study further reveals that most errors are driven by human factors rather than system limitations. Variability in medical judgment, inconsistent policy interpretation, and improper system usage were identified as the primary contributors to approval errors.

Additionally, the analysis shows that a limited number of process steps are responsible for the majority of errors and financial losses. This concentration of issues provides a clear opportunity for targeted improvements that can significantly enhance overall performance.

From a financial perspective, QA audits contribute to reducing the Cost of Poor Quality (COPQ), particularly in high-cost inpatient cases. Operationally, they help reduce rework and improve efficiency, while clinically, they play a key role in minimizing patient safety risks.

Overall, QA audits are not only a quality control mechanism but also a strategic function that supports accuracy, compliance, efficiency, and patient safety within the TPA environment.

4.6 Recommendations

Based on the findings of this study, the following recommendations are proposed:

4.6.1 Strengthening Clinical Decision Support

- Implement standardized clinical justification templates
- Introduce structured checklists for medical necessity evaluation
- Increase senior review for high-risk or complex cases

4.6.2 Enhancing Training and Awareness

- Conduct regular training on CHI/HDF policies
- Focus on improving medical necessity interpretation
- Use real case scenarios for practical learning

4.6.3 Improving System Controls

- Introduce automated validation checks for key decision fields
- Implement system alerts for missing or inconsistent data
- Apply hard-stop rules for critical errors

4.6.4 Targeting High-Risk Process Steps

- Focus improvement efforts on:
 - Medical necessity review
 - Policy compliance checks
 - Eligibility and referral validation

4.6.5 Enhancing Documentation Quality

- Enforce mandatory documentation before approval
- Provide clear documentation standards
- Prevent approvals when essential documents are missing

4.6.6 Strengthening Performance Monitoring

- Develop dashboards for:
 - Error rates
 - FYP (First Yield Pass)
 - CTQ metrics
- Monitor performance at individual and departmental levels

4.6.7 Reducing Financial Impact (COPQ)

- Focus on high-cost error categories
- Track and analyze financial impact regularly
- Implement corrective actions to prevent recurrence

4.6.8 Improving Patient Safety Controls

- Strengthen validation for clinical decisions
- Monitor high-risk cases more closely
- Align QA processes with patient safety standards

4.7 Limitations of the Study

Despite the valuable insights provided, this study has certain limitations:

- It is based on a single TPA case study, which may limit generalizability
- The analysis depends on available QA data, which may not capture all influencing factors
- Behavioral aspects of decision-making were not directly measured

4.8 Future Research Directions

Future research can build on this study by:

- Conducting comparative studies across multiple TPAs
- Exploring the role of artificial intelligence in reducing approval errors
- Analyzing long-term QA performance trends

- Examining the relationship between workload and error rates
- Evaluating advanced decision-support systems

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الملاحق

Appendices

Quality Performance Review Report – Approvals Department

This appendix includes the real operational data used in this study, obtained from the Quality Assurance (QA) department within the medical approvals unit of a health insurance Third-Party Administrator (TPA).

The report covers a comprehensive review of more than 10,000 audited cases during the study period, where 564 cases were identified with errors requiring corrective action.

The identified errors relate to several key areas, including:

- Medical necessity evaluation
- Compliance with CHI/HDF policies
- Eligibility and referral validation
- Documentation quality
- System field usage

The report also includes analysis of key performance indicators such as:

- First Yield Pass (FYP)
- Critical to Quality (CTQ) metrics
- Cost of Poor Quality (COPQ)
- Patient safety-related cases

This report serves as the primary data source for the analysis presented in Chapter 4.

Abstract

This study aims to assess the effectiveness of Quality Assurance (QA) audits in identifying approval errors among health insurance Third-Party Administrators (TPAs). The research uses a case study approach based on actual operational data from the QA department of a medical approvals unit.

The study analyzes more than 10,000 audited cases, identifying 564 cases with approval errors related to medical necessity assessment, policy compliance, eligibility verification, documentation quality, and system usage. The findings indicate that the majority of errors are primarily driven by human factors, including inconsistencies in clinical judgment and policy interpretation, rather than system limitations.

The results also show that most errors and financial losses are caused by a small number of process steps, mainly medical necessity review, policy compliance checks, and eligibility validation.

Additionally, the analysis emphasizes the substantial financial consequences of these errors, particularly in inpatient cases, and their possible impact on patient safety.

The study concludes that QA audits play a critical role in improving decision accuracy, reducing operational inefficiencies, minimizing financial losses, and enhancing patient safety. It also emphasizes the importance of targeted interventions, including improved training, standardized processes, and enhanced system controls, to reduce error rates and improve overall performance.

This research contributes to the existing literature by providing a real-world, data-driven analysis of QA practices within a TPA environment and offers practical recommendations for improving quality and performance in medical approval processes.

جامعة ميدأوشن

كلية الإدارة

قسم / تخصص إدارة الأعمال



العنوان باللغة العربية

تقييم فعالية تدقيقات ضمان الجودة في الحد من أخطاء الموافقات الطبية في شركات إدارة مطالبات التأمين الصحي

إعداد الطالب/ محمد أحمد عبدالله قسم الله

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العام الدراسي:

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