

## Research Article

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## Hand Hygiene Auditing Utilizing the MEG Tool: A Pathway to Enhance Compliance and Perspective from IPAC Auditors

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### ABSTRACT

Hand hygiene is a fundamental practice in preventing healthcare-associated infections (HAIs). This study evaluates the effectiveness of the MEG Tool in improving hand hygiene compliance among nurses and explores the perceptions of Infection Prevention and Control (IPAC) auditors. A prospective observational study was conducted at Royale Hayat Hospital, Kuwait, analyzing 3,000 observations across multiple departments. The MEG Tool, a mobile-based auditing system, was used to assess compliance with the five moments of hand hygiene. Results demonstrated a significant improvement in compliance from 74% to 91.1%. IPAC auditors reported highly positive attitudes regarding usability, efficiency, and accuracy. The study highlights the importance of digital auditing tools in enhancing infection control practices and improving patient safety outcomes.

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### Introduction

Hand hygiene is recognized as the most effective measure to prevent Healthcare-Associated Infections (HAIs). Despite global awareness initiatives, compliance remains suboptimal due to factors such as workload, lack of monitoring, and inefficient auditing systems.

Traditional paper-based auditing methods pose challenges including data inaccuracy, delayed feedback, and limited scalability. The introduction of digital solutions like the MEG Tool represents a significant advancement in infection prevention strategies.

The MEG Tool is a mobile-based audit application designed to monitor hand hygiene practices in real-time. It enables accurate data collection, tracks compliance trends, and supports immediate feedback. It also aligns with the WHO "Five Moments for Hand Hygiene," ensuring standardized monitoring across healthcare settings.

### Aim, Objectives & Hypothesis

#### Aim of the Study

To evaluate the effectiveness of the MEG Tool in improving hand hygiene compliance and to assess IPAC auditors' perspectives toward its use.

#### Objectives of the Study

- To evaluate the effectiveness of the MEG Tool in improving compliance rates
- To assess the attitudes of IPAC auditors toward the MEG Tool
- To assess association between selected demographic variables and attitude of IPAC auditors

#### 1) Hypothesis

- H01:** There is significant improvement in hand hygiene

compliance after implementing the MEG Tool

- H02:** There is significant association between IPAC auditors' attitudes and the usability of the MEG Tool

### Review of Literature

A systematic review by [1] evaluated automated and electronically assisted hand hygiene monitoring systems in healthcare settings [2]. The review identified that electronic monitoring systems improved the efficiency of data collection and reduced the workload associated with manual observation. The authors also reported that electronic tools enhanced the accuracy and consistency of compliance monitoring compared to conventional auditing methods.

Similarly, [2] conducted a systematic review on automated and electronic systems for hand hygiene monitoring [3]. The review highlighted several advantages of electronic auditing tools, including continuous monitoring, automated data analysis, reduced observer bias, and minimal human resource requirements. However, the study also identified limitations such as high implementation costs and inability to assess hand hygiene technique quality comprehensively.

Another systematic review by [3] (2021) discussed recent technological advancements in electronic hand hygiene monitoring systems [4]. The review categorized monitoring technologies into sensor-assisted systems, video-assisted observation, real-time locating systems, and application-assisted direct observation. The authors concluded that electronic monitoring systems improve hand hygiene compliance monitoring and provide real-time feedback, thereby supporting infection prevention practices in healthcare settings.

A literature review by examined the effect of electronic hand hygiene monitoring systems on healthcare workers' compliance [5]. The review found that electronic monitoring technologies positively influenced compliance rates and reduced bias associated with manual audits. The authors emphasized that technologies such as wireless tracking systems, video auditing, and sensor-based monitoring improved both the quality and quantity of hand hygiene monitoring.

### Theoretical Framework for MEG Tool Use in Hand Hygiene Auditing

#### Technology Acceptance Model (TAM)

The most suitable theory for MEG tool use for hand hygiene auditing among IPAC auditors is the:

#### Technology Acceptance Model (TAM)

This theory was developed by Fred to explain how users accept and use new technology systems [6].

#### Why TAM is Suitable for Study

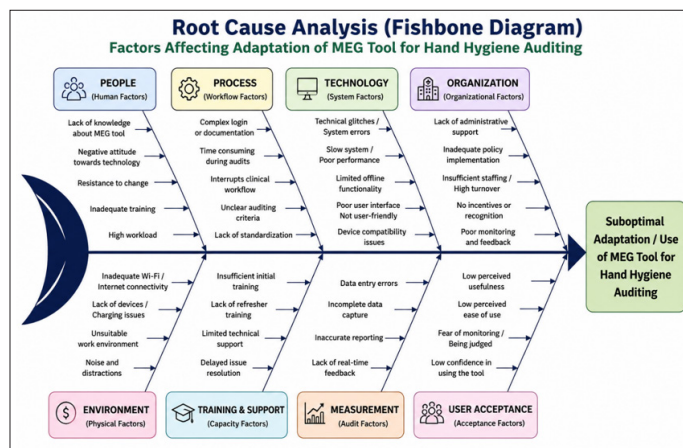
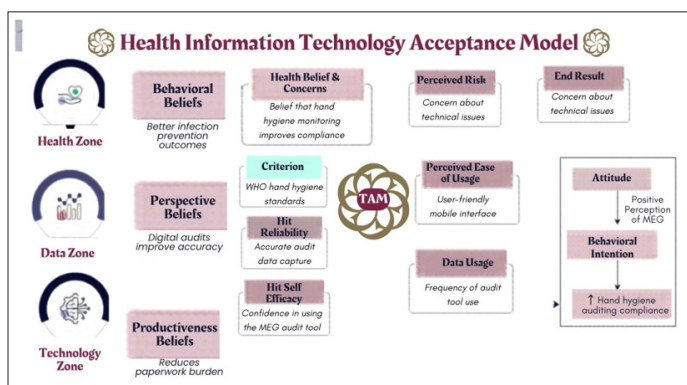
The MEG tool is an electronic/digital auditing system. TAM explains:

- Why auditors use the MEG tool
- Factors affecting acceptance
- Relationship between tool use and attitude

It is commonly used in:

- Health informatics
- Electronic health records
- Digital infection control systems
- Mobile health applications

The Technology Acceptance Model was used as the theoretical framework to assess the relationship between MEG tool use and attitude among IPAC auditors. According to TAM, perceived usefulness and perceived ease of use influence the attitude of users toward adopting technology, which subsequently affects actual system utilization during hand hygiene auditing.



### Material & Methods

#### Research Approach and Design

A quantitative, prospective observational study design was used to evaluate hand hygiene compliance and auditor perspectives.

#### Study Setting

The study was conducted at Royale Hayat Hospital, Kuwait, across multiple clinical departments including ICU, wards, NICU, OR, CSSD, and others

#### Study Population

- Nurses across various departments
- IPAC auditors involved in hand hygiene auditing

#### Sample Size

A total of 3,000 hand hygiene observations were recorded between 2021 and 2025 for assessing hand hygiene compliance

52 auditors attitude was assessed for using MEG tool for hand hygiene auditing

#### Sampling Technique

Convenient sampling technique was used.

#### Study Tool / Instrument

##### MEG Tool (Hand Hygiene Audit App)

The MEG Tool is a digital auditing platform that:

- Tracks WHO five moments of hand hygiene
- Records type of hygiene (alcohol rub, soap & water, none)
- Captures duration of handwashing (>20 seconds or <20 seconds)
- Provides real-time data entry and reporting
- Enables trend analysis and compliance monitoring

#### Questionnaire for IPAC Auditors

##### Section A: Demographic Data

- Age
- Gender
- Years of experience
- Department
- Previous MEG Tool usage

**Section B: Attitude Assessment (Likert Scale)**

**Subtopics (Domains)**

**Perceived Usefulness**

- Improves efficiency of auditing
- Enhances data accuracy
- Reduces paperwork
- Helps track compliance trends
- Supports timely feedback

**Ease of Use**

- Easy to learn and operate
- Simple navigation and data entry
- Enables quick auditing
- Works on Wi-Fi/mobile data
- Minimal technical issues

**Attitude and Acceptance**

- Preference over paper-based methods
- Improves auditor confidence
- Increases motivation
- Supports better infection control outcomes
- Overall positive attitude

**Institutional and Technical Support**

- Adequate training provided
- Technical support availability
- Management encouragement
- Data used for quality improvement
- Recommendation for wider use

**Scoring System**

Likert scale (1–5):

- Strongly Disagree (1) to Strongly Agree (5)

**Interpretation**

**Interpretation was based on median score calculated from IPAC auditors scoring**

SECTION C: Likert Scale to assess attitude of IPAC auditors towards use of MEG tool

The scoring of positive and negative statements indicating the attitude was as follows:

	SA	A	N	DA	SDA
Positive statements	5	4	3	2	1
Negative statements	1	2	3	4	5

SA-strongly agree A- agree N- Neutral DA- disagree

The maximum possible score was 100. Median score was calculated and categorized as follows

>94.5 = Positive attitude

<94.5= Negative attitude

\*calculated median score= 94.5

**Data Collection Procedure**

Data was collected using the MEG mobile application. IPAC auditors recorded observations in real-time during clinical practice. The study was conducted from 2021 to 2025.

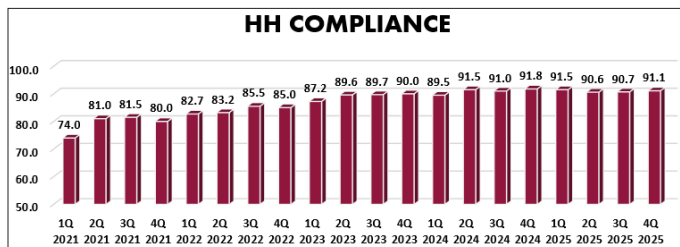
Participants were informed about the purpose of the study, and confidentiality was maintained throughout the process.

**Data Analysis**

- Data analysis was performed using descriptive statistics:
- Percentages and frequencies for compliance
- Trend analysis for hand hygiene compliance over time
- Likert scale analysis for auditor perception

**Results**

**Hand Hygiene Compliance using the MEG Tool for all departments 2021-2025**



**Hand Hygiene Compliance**

- Increased from 74% baseline to 91.1% after MEG Tool implementation

**Trend Analysis**

- Continuous improvement observed from 2021 to 2025 across all departments

**Table 1: Distribution of IPAC Auditors According to Demographic Variables**

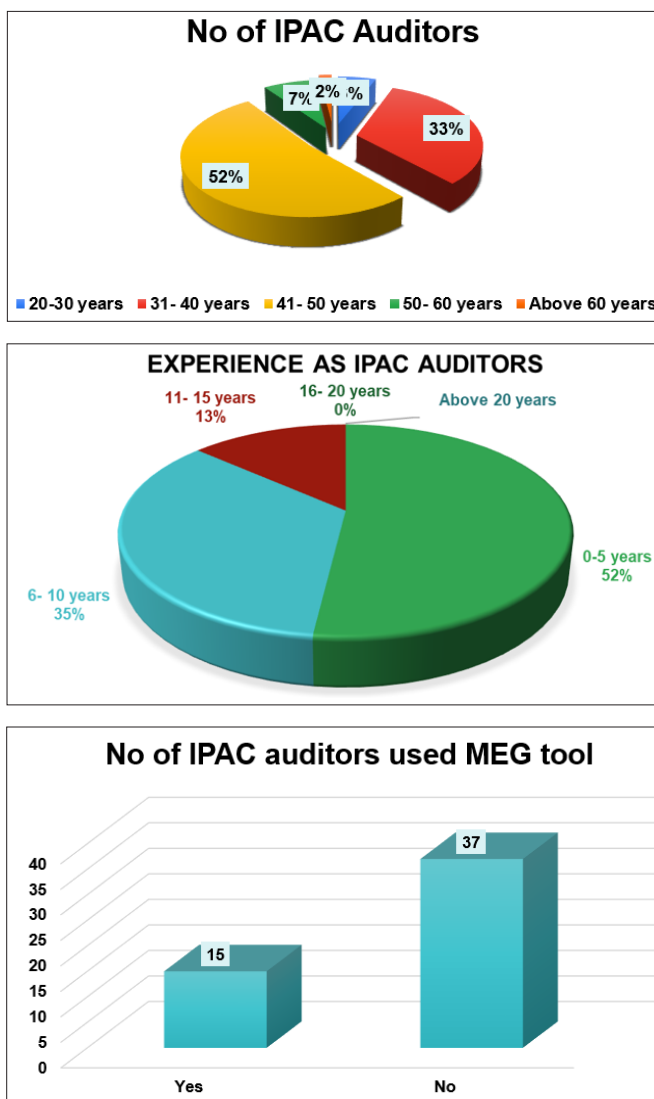
Demographic variables	Category	Frequency	Percentage
		[n]	[%]
Age in years	20-30 years	3	5.8
	31- 40 years	17	32.7
	41- 50 years	27	51.9
	50- 60 years	4	7.7
	Above 60 years	1	1.9
Gender	Female	44	84.6
	Male	8	15.4
Experience as IPAC Auditor (Years)	0-5 years	27	51.9
	6- 10 years	18	34.6
	11- 15 years	7	13.5
	16- 20 years	0	0.0
	Above 20 years	0	0.0
Have you used the MEG mobile app for auditing before?	Yes	15	28.8
	No	37	71.2

**Discussion**

The findings demonstrate that digital auditing tools significantly improve hand hygiene compliance. The MEG Tool enhanced data accuracy, reduced manual workload, and enabled real-time monitoring.

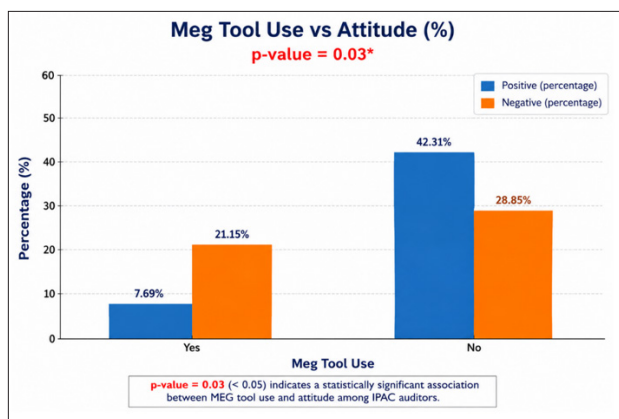
The Positive Attitude of IPAC auditors indicates high acceptance and usability. The ability to track trends and provide immediate feedback contributed to sustained improvement in compliance [7-12].

### Perspectives from IPAC Auditors



**Table 2: Association of Selected Demographic Variables with Attitude of Ipac Auditors Use of Meg Tool for Hand Hygiene Auditing**

Demographic variables	Category	Positive attitude	%	Negative attitude	%	p- value
Experience as IPAC Auditors	0-5 years	11	21.2	16.0	30.8	0.29
	6-10 years	10	19.2	8.0	15.4	
	11-15 years	5	9.6	2.0	3.8	
	16-20 years	0	0.0	0.0	0.0	
	Above 20 years	0	0.0	0.0	0.0	
Demographic variables	Category	Positive attitude	%	Negative attitude	%	P value
Meg Tool use	Yes	4	7.69	11	21.15	0.03*
	No	22	42.31	15	28.85	



### Implications for Nursing Practice

- Improved infection control practices
- Enhanced patient safety
- Efficient audit processes
- Real-time monitoring and feedback
- Reduced administrative burden

### Conclusion

The MEG Tool is an effective digital solution for hand hygiene auditing. It significantly improves compliance rates and enhances auditing efficiency. The positive perception among IPAC auditors supports its wider adoption in healthcare settings.

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