Data and Metadata. 2025; 4:664
doi: 10.56294/dm2025664

ORIGINAL

The Impact of External Auditors Practice of Electronic Auditing on Fraud Detection: External Auditors' Awareness of the Fundamental Principles of Ethics for Members Providing Forensic Accounting Service and Forensic Accountant Skills as Moderate Variables

El impacto de la práctica de auditoría electrónica de los auditores externos en la detección de fraudes: el conocimiento de los auditores externos sobre los principios fundamentales de ética para los miembros que prestan servicios de contabilidad forense y las habilidades de los contadores forenses como variables moderadas

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Cite as: Al-zoubi AM, Al-Tahat SS. The Impact of External Auditors Practice of Electronic Auditing on Fraud Detection: External Auditors' Awareness of the Fundamental Principles of Ethics for Members Providing Forensic Accounting Service and Forensic Accountant Skills as Moderate Variables. Data and Metadata. 2025; 4:664. https://doi.org/10.56294/dm2025664

Submitted: 14-02-2024 **Revised:** 19-07-2024 **Accepted:** 12-02-2025 **Published:** 13-02-2025

Editor: Dr. Adrián Alejandro Vitón Castillo

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ABSTRACT

The objective of the study was to measure the impact of external auditors' electronic auditing practice on fraud detection, and to measure the moderating impact of external auditors' awareness of the fundamental principles of ethics for members providing forensic accounting services and the skills of the forensic accountant on the relationship between external auditors' electronic auditing practice and fraud detection. The descriptive-analytical approach was used to achieve the objective of the study. A questionnaire was designed to collect data on the fundamental principles of ethics, the skills of the forensic accountant, the electronic auditing practice of external auditors and fraud detection. The study population comprised practicing external statutory auditors totaling (521) auditors. A sample of (267) auditors was selected, with (250) valid questionnaires retrieved and analyzed; several statistical tests were performed, including factor analysis, Cronbach's alpha. Smart PLS software was used to test the hypotheses. The study concluded that external auditors' knowledge of the fundamental principles of ethics for members providing forensic accounting services, as well as their knowledge of the skills of forensic accountants, significantly impacts the relationship between external auditors' electronic audit practice and fraud detection. This, in turn, improved the relationship, increasing the likelihood of detecting fraud. The study recommends that external auditors formally adopt the fundamental principles of ethics for members providing forensic accounting services and the skills of forensic accountants in their work, together with the holding of training sessions to ensure the optimal application of these principles and skills in their professional duties.

Keywords: Electronic Auditing; External Auditors; Fraud Detection; Fundamental Principles of Ethics for Members Providing Forensic Accounting Services; Skills of Forensic Accountants.

RESUMEN

El estudio tuvo como objetivo medir el impacto de la práctica de auditoría electrónica de los auditores externos en la detección de fraudes, y medir el impacto moderador de los auditores externos conscientes de los principios fundamentales de ética para los miembros que brindan servicios de contabilidad forense y

las habilidades del contador forense en la relación entre la práctica de auditoría electrónica de los auditores externos y la detección de fraudes. El enfoque descriptivo-analítico se utilizó para lograr el objetivo del estudio. Se diseñó un cuestionario para recopilar datos sobre los principios fundamentales de la ética, las habilidades del contador forense, la práctica de auditoría electrónica de los auditores externos y la detección de fraudes. La población del estudio comprendió auditores legales externos en ejercicio que totalizaron (521) auditores. Se seleccionó una muestra de (267) auditores, con (250) cuestionarios válidos recuperados y analizados; se realizaron varias pruebas estadísticas, incluido el análisis factorial, el alfa de Cronbach. Se utilizó el software Smart PLS para probar las hipótesis. El estudio concluyó que el conocimiento de los auditores externos sobre los principios fundamentales de ética para los miembros que prestan servicios de contabilidad forense, así como su conocimiento de las habilidades de los contadores forenses, impacta significativamente la relación entre la práctica de auditoría electrónica de los auditores externos y la detección de fraudes. Esto, a su vez, mejoró la relación, aumentando la probabilidad de detectar casos de fraude. El estudio recomienda que los auditores externos adopten formalmente los principios fundamentales de ética para los miembros que prestan servicios de contabilidad forense y las habilidades de los contadores forenses en su trabajo, junto con la realización de sesiones de capacitación para asegurar la aplicación óptima de estos principios y habilidades en sus deberes profesionales.

Palabras clave: Auditoría Electrónica; Auditores Externos; Detección de Fraudes; Principios Fundamentales de Ética para los Miembros que Prestan Servicios de Contabilidad Forense; Habilidades de los Contadores Forenses.

INTRODUCTION

The standards, guidelines, and ethics governing professions and their associated services vary. Adherence to professional and ethical standards, along with the mastery of fundamental skills by service providers, is considered critical. Among these services, that is what is referred to as forensic accounting services. The Accounting Professional and Ethical Standards Board (APESB), in its 2019 Code (APES 215) on Forensic Accounting Services, mandates that providers of forensic accounting services adhere to the fundamental principles of ethics, which include integrity, objectivity, professional competence, confidentiality, and professional behavior.[1]

These principles are applied to members working in professional bodies and those in public practice. The pre mentioned Code defines members in professional practice as individuals working in firms that provide professional services, whether in auditing, taxation, or consulting. The services are described as professional activities performed for clients, who are identified as the entities for which the firm conducts audit engagements[2] accordingly, we see that the hierarchy of concepts shows the correlation between auditors who provide professional services and members who offer forensic accounting services. Therefore, auditors must adhere to and aware the fundamental principles of ethics for members providing forensic accounting service and any other related matters such as the skills forensic accountants should possess. This is because their skills align with those of auditors, such as interpreting and analyzing data and detecting fraud, This alignment is consistent with what[3] described, characterizing forensic accounting as the integration of accounting and auditing skills. A forensic accountant is viewed as a combination of an auditor and a private investigator.[4] Additionally, auditors are often involved in judicial investigations.[5] Thus, auditing plays a crucial role in forensic accounting. Forensic accounting is linked to external auditors in two significant ways. First, members who provide forensic accounting services are the auditors themselves. Second, the skills of forensic accountants should also be possessed by auditors.

Another dimension of the study focuses on the impact of electronic auditing on fraud detection. Electronic auditing has developed as a result of the gradual integration of technological advancements into accounting and financial systems.[6] This development has become essential to keeping pace with current technological trends. Regarding its impact on fraud, numerous studies, some of which are highlighted below, have demonstrated that auditing plays a significant role in fraud detection and mitigation. Examples include studies by.[7,8,9,10]

Based on the outlined impact of external auditors when utilizing electronic auditing for fraud detection and the critical role of auditing in forensic accounting due to its association with external auditors, as well as the importance of external auditors' awareness of the fundamental principles of ethics for members providing forensic accounting service and forensic accountant skills, a gap remains in Literature review. Specifically, Literature review have not addressed the moderating impact of external auditors' awareness of the Fundamental principles of ethics for forensic accounting service providers and their awareness of forensic accountant skills on the relationship between external auditors' practice of electronic auditing and fraud detection.

Thus, this study aims to address the following questions:

1. Does external auditors' practice of electronic auditing impact on fraud detection?
2. Does external auditors' awareness of the fundamental principles of ethics for members providing forensic accounting service impact the relationship between external auditors' practice of electronic auditing and fraud detection?
3. Does external auditors' awareness of forensic accountant skills impact the relationship between external auditors' practice of electronic auditing and fraud detection?

Literature review

This section will address three key areas: An overview of forensic accounting, including the relationship between forensic accountants and auditors, an explanation of the skills required by forensic accountants, and the fundamental principles of ethics for members providing forensic accounting service, A review of literatures on the impact of forensic accounting on fraud detection, And a literatures of studies on the impact of auditors or electronic auditing on fraud detection.

Forensic accounting is defined as a blend of accounting, auditing, and investigative skills used to examine the financial affairs of individuals and businesses.[11] It has been employed by government agencies to detect and investigate significant frauds. Today, it is utilized by lawyers, police, insurance companies, regulatory agencies, banks, courts, and business communities.[12] Forensic accounting services encompass a wide range of investigative, analytical, and independent consulting services.[13] These services involve ongoing or potential dispute resolution, investigating money laundering, and various types of fraud such as managerial fraud, tax fraud, bankruptcy, and securities fraud. This distinguishes them from advisory services that consider the possibility of fraud.[14] Forensic accountants often testify in civil and criminal court proceedings as expert witnesses.[4] They assist in investigating financial and commercial matters[15] forensic accounting services generally involve applying specialized knowledge and investigative skills possessed by members who are certified public accountants (auditors) to collect, analyze, and evaluate forensic evidence, interpret findings, and communicate them to users such as courts, boards, or other legal or administrative bodies.[16,17] Services also include developing computerized applications to aid in analyzing and presenting financial evidence, delivering findings in reports, and assisting in legal proceedings[12] the application of forensic accounting services and tools like forensic auditing, investigation, evaluation, and litigation support helps prevent and detect fraud[18,19,20,21,22] and reduces financial crimes.[23]

Regarding the skills that providers of forensic accounting services, i.e., forensic accountants, must possess,[24] highlighted several fundamental skills: auditing, investigation, communication, criminology (especially criminal psychology), legal and technological knowledge, and proficiency in accounting sciences. [25] emphasized that forensic accountants must combine accounting, auditing, and investigative skills.[26] stated that forensic accountants must have skills in accounting, auditing, investigation, analysis, and working within a legal framework.[27,28] Indicated that fundamental skills include communication, investigation, critical thinking, auditing, synthesis, research, deductive analysis, problem-solving, and analytical skills.[29] added that applying analytical and investigative skills is necessary for resolving financial issues.[30] stated that forensic accountants must have analytical proficiency.[31] pointed out that forensic accountants need to possess analytical, investigative, and communication skills.[32] suggested that these skills must be implementable within specific guidelines to resolve unresolved issues.[4] noted that forensic accountants must have multiple skills, including investigation, research, legal, auditing, and accounting skills.[33] stated that forensic accountants' knowledge should include auditing, accounting, statistics, information technology, legal rules, and human skills.[34] expressed that forensic accountants use auditing and investigative skills to assist in legal matters, consisting of two main elements: litigation services is recognizing the accountant's role as a consulting expert, and investigation services its use skills of accountant forensic and which do not necessarily require court testimony.

Regarding the fundamental principles of ethics for members providing forensic accounting service, the study relied on the Code of Ethics for Professional Accountants No. 110 issued by the Accounting Professional & Ethical Standards Board (APES) in 2022. These principales include:[2]

1. Integrity: to achieve this principle, a member must be straightforward and honest in all professional and business relationships, steadfast when facing dilemmas and difficult situations, and challenge others when circumstances require. They must not intentionally associate with reports that contain materially false or misleading statements or that are recklessly prepared. If a member is associated with the aforementioned, they must take corrective actions.
2. Objectivity: to achieve this principle, a member must exercise professional judgment without bias, without consideration of conflicting interests, without undue influence or reliance on individuals or entities, and without unjustified reliance on technology. A member should not engage in any professional activity if there is a relationship that inappropriately affects their professional judgement.
3. Professional Competence and Due Care: to achieve this principle, a member must acquire professional knowledge and skills based on technical and professional standards, act diligently according

to these standards, and exercise sound judgement in applying knowledge and skills when performing professional activities. A member should be continuously aware relevant technical, professional, business, and technological developments, act according to professional requirements with care, precision, and in a timely manner, take reasonable steps to ensure that individuals working professionally under the member's authority receive proper training and supervision, and inform clients or the company they work for about professional activities.

4. Confidentiality: to achieve this principle, a member must be cautious about the possibility of unintentional disclosure to a close work partner or a close family member, maintain the confidentiality of information within the company they work for, maintain the confidentiality of information disclosed by a potential client or employer, and not disclose confidential information obtained as a result of professional and business relationships outside the company they work for unless there is a legal or professional duty or right to disclose it. A member must not use information to achieve personal interest or benefit a third party and must not use or disclose any confidential information, whether obtained or received as a result of a professional or business relationship after that relationship ends. Disclosure is allowed only by law, such as disclosure to competent public authorities, or if there is a professional right requiring disclosure, such as protecting the professional interests of the member under legal procedures, and adhering to technical and professional standards. A member must continue to adhere to the principle of confidentiality even after the relationship between the member and the client or organization ends, considering the characteristics of confidential information when disclosure is permitted, ensuring the information is complete and reliable.

5. Professional Behavior: to achieve this principle, a member must comply with laws and regulations relevant to the accounting profession, auditing, and the subject of the research, act in a manner consistent with the responsibility of the profession to work for the public interest in all professional activities and work relationships, avoid any behavior that may harm the profession's reputation, not engage intentionally in any action or profession or activity that impairs or may impair the integrity, objectivity, or good reputation of the profession.

In terms of forensic accounting and fraud, the study by[35] highlights the significant role of forensic accounting in detecting and preventing fraudulent activities. It emphasizes enhancing the effectiveness of fraud detection and prevention and identifies forensic accounting as a critical component in supporting financial fraud prevention in the digital era.[36] demonstrates that forensic accounting contributes to combating corruption by addressing fraud as one of its forms, particularly in the age of digitization and digital transformation. This is achieved through innovative methods and technologies, including computer-assisted auditing tools and modern auditing techniques.[37] indicates that forensic accounting teams possess specialized expertise in analyzing fraud and producing reports that provide a clear description of fraudulent activities. Forensic accounting plays a crucial role in helping companies detect, address, and prevent fraud using an evidence-based approach. Effective auditing procedures can reveal potential fraud and provide guidance for necessary improvements in internal controls.[8] emphasize the importance of forensic accounting's professional and ethical standards in detecting financial fraud, while[38] identifies forensic accounting as a vital tool for uncovering financial fraud.[39] Found that forensic auditors have the expertise and skills needed to easily detect and prevent fraudulent activities.[40] Recommended the employment of forensic auditors as part of audit teams, which would effectively address fraud detection challenges.[41] Showed that applying forensic accounting services to companies affects the level of fraudulent activities. IIA[42] highlighted the role of forensic accounting techniques in detecting and verifying fraud through the implementation of audit controls.

In terms of auditing and fraud, several studies have examined the impact of auditors or electronic auditing on fraud detection and reduction.[7] Found that auditor professionalism significantly affects fraud detection and reduction.[9] Recommended the effective and widespread adoption of electronic auditing to ensure financial fraud detection.[8] Noted that modern auditing practices and technological advancements enhance financial fraud detection, transparency, and trust.[43] Emphasized the positive and significant impact of auditor expertise and forensic auditing on fraud detection.[10] Highlighted that an external audit framework for continuous fraud assessment helps reduce fraudulent activities, such as preventing illegal actions and lowering asset misappropriation levels.[44] Stated that the primary objective of independent auditors is to mitigate the risk of information asymmetry and fraudulent behavior. According to international auditing standards, auditors are required to detect fraud.[45] Highlighted the increasing importance of analytical auditing methods in identifying and detecting potential fraud evidence.[46] demonstrated that risk assessment, system auditing, and financial report verification significantly influence fraud detection.[47] Argued that it is essential for the Public Company Accounting Oversight Board (PCAOB) and the American Institute of Certified Public Accountants (AICPA) to update generally accepted auditing standards (GAAS) to mandate electronic auditing and reduce fraud risks.[48] Noted that auditors' lack of leadership and communication skills is a primary cause of fraud, suggesting that

possessing these skills would enhance fraud detection and prevention.[49] Pointed out that external auditors lend credibility to financial statements and detect fraud but cannot uncover all types of fraud due to the scope and limitations of their responsibilities. They recommended expanding auditors' responsibilities for fraud detection and encouraging auditors to perform their best in this area.[50] emphasized that auditors should be familiar with fraud detection techniques, as many fraud cases are identified by observing fraud indicators and tracing missing or falsified documents. The ability of auditors to recognize these signs through their expertise significantly aids in detecting fraudulent activities.

METHOD

The study population consisted of practicing external legal auditors in Jordan, totaling (521) auditors.[51] The descriptive analytical method was used to achieve the study's goal, with a questionnaire prepared as a tool for the study, distributed to (267) auditors selected randomly, and (250) valid questionnaires were retrieved for analysis, representing the study sample. This number is considered appropriate for the population size according to.[52] The study tool was divided into many parts: the first part covered the personal data of the auditors, the second part covered the awareness ofexternalauditors the skills of forensic accountants classified into fundamental and enhanced skills, and the third part covered the external auditors' awareness ofthe fundamental principles of ethics for members providing forensic accounting service, classified into five principles: integrity, objectivity, professional competence and due care, confidentiality, and professional behavior, Part Four: The Practice of External Auditors in Electronic Auditing, and Finally, Part Five: Fraud Detection.

The Literature reviews reviewed above reflect many impacts and correlations between the study variables as follows: the impact of electronic auditing on fraud detection, the general impact of auditing (whether electronic or traditional) on fraud, and finally, the impact of forensic accounting on fraud. Here, twokeypoints are observed:

1. First Point: although all Literature reviews have addressed various impacts between the variables, there is still a gap that has not been addressed by Literature reviews: the lack of measurement of the moderating impact of the fundamental principles of ethics for members providing forensic accounting service and the skills of forensic accountants on the relationship between the practice of external auditors in electronic auditing and fraud detection.
2. Second Point: All observed impacts between the variables are positive. Based on this, the study hypotheses were formulated to be proven, as outlined below:

H-1: there is an impact of the external auditors' practice of electronic auditing on fraud detection.

H-2: there is an impact of external auditors' awareness of the fundamental principles of ethics for members providing forensic accounting service on the relationship between the external auditors' practice of electronic auditing and fraud detection.

H-3: there is an impact of external auditors' awareness of forensic accountant skills on the relationship between the external auditors' practice of electronic auditing and fraud detection.

These hypotheses reflect the following theoretical model of the study:

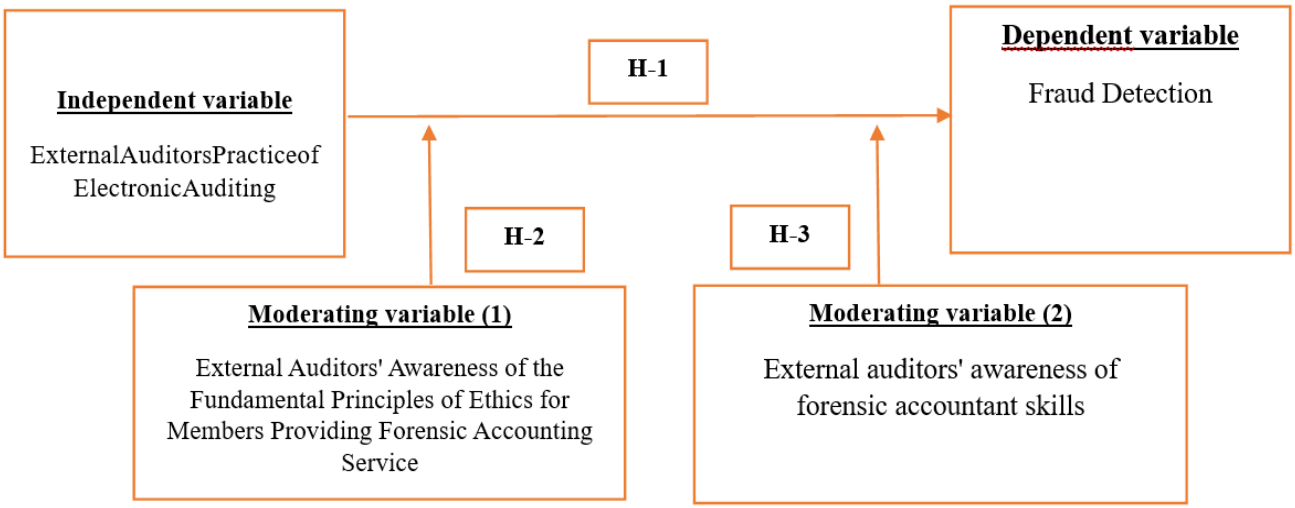

Figure 1. Theoretical model of the study

https://doi.org/10.56294/dm2025664

RESULTS AND DISCUSSION

Characteristics of the Sample

Table 1. Frequencies and Percentages

Characteristic	Classification of Characteristic	Frequency	Percentage (%)
Educational Qualification	Bachelor's	169	67,60
	Higher Diploma	27	10,80
	Master's	39	15,60
	Doctorate	15	6,00
	Total	250	100,00
Years of experience	less than 3 years	0	0,00
	3 to less than 6 years	28	11,20
	6 to less than 9 years	163	65,20
	9 years and more	59	23,60
	Total	250	100,00
Specialty	Accounting	194	77,60
	another specialization within the scope of business	56	22,40
	Total	250	100,00
Have you previously conducted any forensic accounting engagements?	Yes	250	100
	No	0	0
	Total	250	100,00
If the answer is yes, please specify the forensic accounting work conducted:	Investigation of fraud cases	71	28,40
	Investigation of bribery cases	12	4,80
	Investigation of money laundering cases	60	24,00
	Investigation of embezzlement cases	12	4,80
	Investigation of disputes and claims	95	38,00
	Total	250	100,00
Professional Certifications	Jordanian Certified Public Accountant (JCPA)	250	100,00
	Total	250	100,00
Job Title	Auditor	250	100,00
	Total	250	100,00

Upon reviewing the table above, it is noted that the selected sample is suitable for study for several reasons:

1. The job title of the sample individuals corresponds to the definition provided in Professional Ethics Code No. 110 issued by the Council of Professional and Ethical Standards for Accounting for the year 2022, which was relied upon in this study.
2. All sample individuals hold the Jordanian Certified Public Accountant (JCPA) certification.
3. All sample individuals possess experience in forensic accounting through their execution of the five mentioned forensic accounting tasks in the table above.
4. All sample individuals have extensive experience in auditing activities, within the required specialization for auditing tasks, and hold at least a bachelor's degree.

Before commencing the analysis of the study data related to the study fields andtesting the hypothesis, several preliminary tests were conducted, including testing the normal distribution of data and the Factorial validity to determine whether the questionnaire questions belong to their fields. Internal consistency testing (Cronbach's alpha) of the questionnaire questions was also conducted to assess their reliability.

Normality Test

As shown in the table below, the normal distribution test indicates that the study data related to both the fundamental principles of ethics for members providing forensic accounting service and the required skills for

external auditors as well as the external auditors' practice of electronic auditing, and finally, fraud detection, are normally distributed. This is because they met the criteria for normal distribution of data as follows:

a. The Sig. values for both Kolmogorov-Smirnov and Shapiro-Wilk tests were above 0,05.
b. Skewness and Kurtosis test results were close to zero and fell within the range of -1 to +1.[53]

Table 2. Kolmogorov-Simirnove and Skewness and Kurtosis

Principles/Skills	Shapiro-wilk	Kolmogorov-simirnove	Skeweness	Kurtosis
Fundamental Principles of Ethics for Members Providing Forensic Accounting Service				
Integrity	0,668	0,344	0,008	0,178
Objectivity	0,720	0,359	0,005	0,190
Professional Competence and Due Care	0,654	0,410	0,009	0,187
Confidentiality	0,732	0,328	0,016	0,176
Professional behavior	0,666	0,398	0,019	0,185
Forensic Accountant Skills				
Fundamental skills	0,660	0,356	0,006	0,175
Enhanced skills	0,682	0,335	0,014	0,166
ElectronicAuditing				
The External Auditors Practice of Electronic Auditing	0,715	0,321	0,013	0,165
Fraud				
FraudDetection	0,685	0,375	0,004	0,180

Factorial Analysis Test

The table below demonstrates that each question in the questionnaire has a strong relationship with its respective field and is closely associated with it. This is based on the concept of Factor Loadings, which indicate the relationship and degree of association each question has with a specific factor. If the factor loading is greater than 30 %, it means that the question is related to its fields and contributes well to describing it. Conversely, if the factor loading is less than 30 %, the question can be disregarded and not considered.[54] From the table, it is evident that all questions belong to their respective fields and none can be disregarded since the factor loadings are all greater than 30 %.

Table 3. Loading Degree for Questions

The External Auditors Practice of Electronic Auditing		Fraud Detection		professional behavior		Confidentiality		Professional Competence and Due Care		Objectivity		Integrity		Enhanced skills		Fundamental skills	
0,81	Q1	0,914	Q1	0,816	Q1	0,867	Q1	0,78	Q1	0,886	Q1	0,922	Q1	0,933	Q1	0,854	Q1
0,822	Q2	0,75	Q2	0,802	Q2	0,854	Q2	0,732	Q2	0,876	Q2	0,912	Q2	0,912	Q2	0,821	Q2
0,906	Q3	0,903	Q3	0,816	Q3	0,866	Q3	0,731	Q3	0,851	Q3	0,921	Q3	0,901	Q3	0,843	Q3
0,875	Q4	0,9	Q4	0,804	Q4	0,891	Q4	0,751	Q4	0,887	Q4	0,911	Q4	0,895	Q4	0,866	Q4
		0,886	Q5			0,845	Q5	0,829	Q5	0,847	Q5	0,915	Q5	0,942	Q5	0,876	Q5
						0,832	Q6	0,754	Q6			0,914	Q6	0,932	Q6	0,854	Q6
						0,835	Q7	0,744	Q7			0,894	Q7	0,941	Q7	0,876	Q7
						0,849	Q8							0,917	Q8	0,832	Q8
						0,864	Q9									0,88	Q9
						0,845	Q10									0,894	Q10
						0,886	Q11									0,941	Q11

Reliability of the Study Tool

The reliability of the study tool was measured using the internal consistency reliability test, Cronbach's Alpha. Reliability is distributed across several levels:

1. Reliability is considered weak if the test value is less than 60 %.

2. Reliability is considered acceptable if the test value is in the range of 70 %.
3. Reliability is considered good if the test value is more than 80 %.[52]

Table 4. Cronbach's Alpha Reliability Coefficient for the Study Tool

Fields	Number of Questions	Cronbach's Alpha
Fundamental Principles of Ethics for Members Providing Forensic Accounting Service		
Integrity	7	0,961
Objectivity	5	0,862
Professional Competence and Due Care	7	0,951
Confidentiality	11	0,960
Professional behavior	4	0,729
Forensic Accountant Skills		
Fundamental skills	11	0,978
Enhanced skills	8	0,966
The External Auditors Practice of Electronic Auditing	4	0,845
FraudDetection	5	0,824

From the above table, we observe that the Cronbach's Alpha values for all study fields are higher than 80 %, making them acceptable and good. The exception is the questions in the field of professional behavior, which fall in the range of 70 %, making them acceptable. Therefore, the questionnaire questions are considered reliable and can be depended upon, as applying them multiple times will yield consistent results.

Measurement of Moderating Variables

This section presents the moderating variables, which include external auditors' awareness of forensic accountant skills and the external auditors' awareness of the fundamental principles of ethics for members providing forensic accounting service, as outlined below.

External auditors awareness off orensicac countant skills

Table 5. Means and Standard Deviations for Fundamental and Enhanced Skills of Forensic Accountant

Fields/Questions	Mean	Standard deviation
Fundamental skills		
I aware that forensic accountants must have oral communication skills	2,25	0,852
I aware that forensic accountants must have investigative flexibility	2,87	0,742
Iaware that forensic accountants must have critical/strategic thinking skills	3,41	0,498
I aware that forensic accountants must have deductive analysis skills	3,98	0,476
I aware that forensic accountants must have analytical proficiency skills	4,25	0,426
I aware that forensic accountants must have auditing skills	4,85	0,395
I aware that forensic accountants must be able to identify key issues	4,65	0,413
I aware that forensic accountants must have investigative intuitiveness	3,61	0,421
I aware that forensic accountants must have research skills	3,97	0,472
I aware that forensic accountants must have problem-solving skills for structured and unstructured problems	3,72	0,520
I aware that forensic accountants must synthesize results of discovery	4,89	0,416
Overall Mean	3,86	
Enhanced Skills		
I aware that forensic accountants must have skills in analyzing and interpreting information and financial statements	4,35	0,433
I aware that forensic accountants must have testifying skills	3,22	0,481
I aware that forensic accountants must have fraud detection skills	4,76	0,492
I aware that forensic accountants must have electronic discovery skills	4,18	0,434
I aware that forensic accountants must have general knowledge of rules of evidence and civil	3,99	0,501
I aware that forensic accountants must have interviewing skills	4,36	0,461
I aware that forensic accountants must have conflict negotiation and resolution skills	3,86	0,421
I aware that forensic accountants must have knowledge of law enforcement	4,38	0,486
Overall Mean	4,14	

The table above indicates that the general trend of the responses from the study sample suggests an agreement on awarenessof the skills required for forensic accountants. This is because the overall average for both fundamental and enhanced skills was above (3), Additionally, the responses were consistent and not widely dispersed, as the standard deviations were within the 50 % range. The sample agreed that forensic accountants must possess a number of fundamental and enhanced skills shown in the table above, which had an average rating above (3). This result aligns with studies by Hopwood et al. (2012), Olabode and Moses (2023), Shakir and Thabit (2020), Davis et al. (2010), Digabriele (2008), Oyedokun (2022), Okoye and Jugu (2010), Salleh et al. (2010), Abdulrahman et al. (2020), Gray (2008), and Wijerathna and Perera (2020).

On the other hand, the auditors did not aware some skills that forensic accountants should possess, which had an average rating below (3), such as oral communication skills and investigation flexibility. The responses were dispersed, indicating that some auditors agreed with these skills while others significantly disagreed, with more dissenting than agreeing. This result differs from certain parts of the studies by Hopwood et al. (2012), Olabode and Moses (2023), Davis et al. (2010), Digabriele (2008), and Salleh et al. (2010) regarding oral communication skills and investigation flexibility.

From the previous result, which showed that the auditors did not aware (2) out of (20) skills, it demonstrates the auditors' awareness and knowledge of the skills required for forensic accountants. This result may indicate that the external auditors currently performing the duties of forensic accountants are responsible enough to carry out their tasks.

External auditors awareness of the Fundamental Principles of Ethics for Members Providing Forensic Accounting Service

Table 6. The Means and Standard Deviations for the Fundamental Principles of Ethics for Members Providing Forensic Accounting Service

Fields/Questions	Mean	Standard deviation
Integrity		
I aware that a member must be straightforward and honest in all professional and business relationships.	4,25	0,852
I aware that a member must be steadfast when facing challenges and difficult situations.	3,65	0,742
I aware that a member must challenge others when circumstances require it.	3,55	0,498
I aware that a member must not knowingly be associated with reports containing materially false or misleading statements.	4,11	0,476
I aware that a member must not knowingly be associated with reports containing reckless information.	3,98	0,426
I aware that a member must not knowingly be associated with misleading reports resulting from omission or concealment of required information.	3,99	0,395
If a member is associated with the above questions, I aware that steps must be taken to disassociate them.	3,10	0,413
Overall Mean	3,80	
Objectivity		
I aware that a member must exercise professional judgement without bias.	4,35	0,433
I aware that a member must exercise professional judgement without consideration of personal interests and conflicts.	3,22	0,481
I aware that a member must exercise professional judgement without undue influence or reliance on individuals or companies.	4,76	0,492
I aware that a member must exercise professional judgement without undue reliance on technology.	4,18	0,434
I aware that a member must not undertake any professional activity if there is a relationship that adversely affects their professional judgement.	3,99	0,501
Overall Mean	4,10	
Professional Competence and Due Care		
I aware that a member must acquire professional knowledge and skills based on technical and professional standards.	3,42	0,413
I aware that a member must act diligently in accordance with applicable technical and professional standard	3,67	0,520
I aware that a member must exercise sound judgement in applying professional knowledge and skills when performing professional activities.	4,32	0,401
I aware that a member is required to maintain professional competence through ongoing awareness and understanding of relevant technical, professional, and business developments.	2,32	0,607

https://doi.org/10.56294/dm2025664

I aware that a member must act with care, thoroughness, and in a timely manner according to professional requirements.	3,55	0,562
I aware that a member must take reasonable steps to ensure that those working in a professional capacity under their authority receive appropriate training and supervision.	2,45	0,771
I aware that a member must make clients or the employing organization aware of professional activities undertaken.	2,11	0,762
Overall Mean	3,12	
Confidentiality		
I aware that a member must be careful about the possibility of unintentional disclosure to a close business partner or immediate family member.	2,43	0,632
I aware that a member must maintain confidentiality of information within the organization they work for.	4,13	0,411
I aware that a member must not disclose confidential information obtained as a result of professional and business relationships outside the employing organization, unless there is a legal or professional right or duty to disclose.	3,95	0,512
I aware that a member must not use confidential information obtained as a result of professional and business relationships to achieve personal interest or for the benefit of a third party.	4,32	0,463
I aware that a member must not use or disclose any confidential information obtained because of a professional or business relationship, even after that relationship has ended.	4,36	0,487
I aware that a member must disclose information only when required by law, such as to relevant public authorities.	4,01	0,429
I aware that a member must disclose information only when there is a professional right to do so, such as to protect the member's professional interests according to legal procedures or to comply with technical and professional standards.	4,25	0,498
I aware that a member must continue to adhere to the principle of confidentiality after the relationship between the member and the client or organization has ended.	4,36	0,564
I aware that the characteristics of the confidential information must be considered when disclosure is allowed, ensuring that the information is complete and reliable.	4,12	0,597
Overall Mean	3,99	
Professional Behavior		
I aware that a member must comply with laws and regulations relevant to the accounting and auditing profession and the organization requiring the research.	4,25	0,468
I aware that a member must act in a manner consistent with the responsibility of the profession to work in the public interest in all professional activities and work relationships.	3,98	0,583
I aware that a member must avoid any behavior that may discredit the profession.	4,11	0,467
I aware that a member must not knowingly engage in any work, profession, or activity that undermines or may undermine the integrity, objectivity, or good reputation of the profession.	3,76	0,612
Overall Mean	4,03	

The means listed in the table above indicate that the general trend of opinions among external auditors is that they aware the fundamental principles of ethics for members providing forensic accounting service. These principles include Integrity, Objectivity, Professional Competence and Due Care, Confidentiality, and Professional Behavior. However, the level of aware varies from one principle to another and from one question to another due to the nature of the principle or question.

The highest level of auditor aware is for the principle of Objectivity, while the lowest is for Professional Competence and Due Care. The reason for this may be that the principle of Objectivity aligns with general ethics for any profession, emphasizing unbiased work and avoiding conflicts of interest. Auditors aware the necessity of Professional Competence and Due Care, as evidenced by a moderate average score (3,12). However, the lower average score may indicate a lack of familiarity with the Code of Ethics for Professional Accountants, No. 110, issued by the International Ethics Standards Board for Accountants (IESBA) in 2022, which was the basis for the aforementioned fundamental principles.

The questions with an average score below (3) indicate a lack of auditor awareness of those principles. These questions pertain to Professional Competence and Due Care and highlight the auditors' lack of awareness regarding the requirements for members providing forensic accounting services. This includes raising client awareness about professional activities; ensuring reasonable steps are taken to provide adequate training and supervision for individuals working under their authority, maintaining ongoing awareness of relevant technical, professional, commercial, and technological developments to preserve professional competence. These points

intersect with human resources and technology in terms of client education, training, and keeping up with technological advancements, which are fundamental in the modern era.

Another question under the principle of Confidentiality, with an average score below (3), indicates that auditors are unaware that members must be cautious about disclosing information to close business partners or family members. This result might conflict with the fundamental principles of auditing or investigations, which require no familial relationships to maintain objectivity and avoid conflicts of interest. Therefore, it is recommended to conduct a study on the reasons behind this inconsistency.

The results of the means for all questions of the fundamental principles show that auditors do not awareness (4) out of (32) principles, which equates to 3,125 % andthispercentageissmall .This indicates the auditors' awareness and knowledge of the fundamental principles forensic accountants should possess. It suggests that auditors currently performing forensic accounting duties can adapt to and execute these roles if required.

Measurement of Independent and Dependent Variables

In this section, the independent variable, the external auditors practice of electronic auditing, and the dependent variable, fraud detection, will be presented as outlined below:

Table 7. Means and Standard Deviations for the Practice of External Auditors in Electronic Auditing and Fraud Detection

Fields/Questions	Mean	Standard deviation
External Auditors practice of Electronic Auditing		
Depends on computer systems during external audit procedures.	4,025	0,567
Use of specific electronic software for conducting external audits.	4,235	0,461
Creation of electronic audit trails to document all steps of the external audit process.	3,856	0,581
Analysis of data obtained by external auditors electronically.	3,956	0,410
Overall Mean	4,018	
FraudDetection		
Fraud cases related to bribery were detected.	3,849	0,504
Fraud cases related to money laundering were detected.	3,880	0,373
Fraud cases related to embezzlement were detected	3,956	0,462
Fraud cases related to disputes and compensations were detected.	3,936	0,531
Fraud cases related to general fraud issues were detected.	3,836	0,589
Overall Mean	3,891	

The mean presented in the table above indicate that external auditors employ electronic auditing during their audit procedures. This is achieved through the use of computers, software, electronic data analysis, and the creation of electronic audit trails to document all steps of the external audit process. This highlights the advancement of external auditing and demonstrates how external auditors are keeping pace with technological developments in this era.

Moreover, all respondents in the study sample were involved in detecting fraud cases. This is evidenced by the fact that the arithmetic averages exceeded the general mean of (3), and the standard deviation was relatively low, indicating minimal dispersion in the responses. In other words, the responses of the study sample are concentrated near or above the general mean. The most frequently detected fraud cases are related to embezzlement, disputes, and compensation claims presented in courts.

Hypotheses testing

was conducted using the Smart PLS software as detailed below.

Testing the First Hypothesis:

H-1: there is an impact of external auditors' practice of electronic auditing on fraud detection.

The predictive capabilities of the model were assessed prior to conducting the correlation and impact analysis between the independent variable and the dependent variable. It was found that the model's predictive relevance (Q^2) is 0,450, as shown in the table below. This indicates that the model is of high quality and has predictive relevance, making it reliable. This aligns with[55] who stated that if $Q^2 > 0$, the model has predictive relevance, while if $Q^2 < 0$, the model lacks predictive relevance.

Table 8. Structural Model Evaluate

P-Value	Q²predict	Adj. R-Square	R-Square	R	
0	0,45	0,456	0,46	0,678	Fraud detection

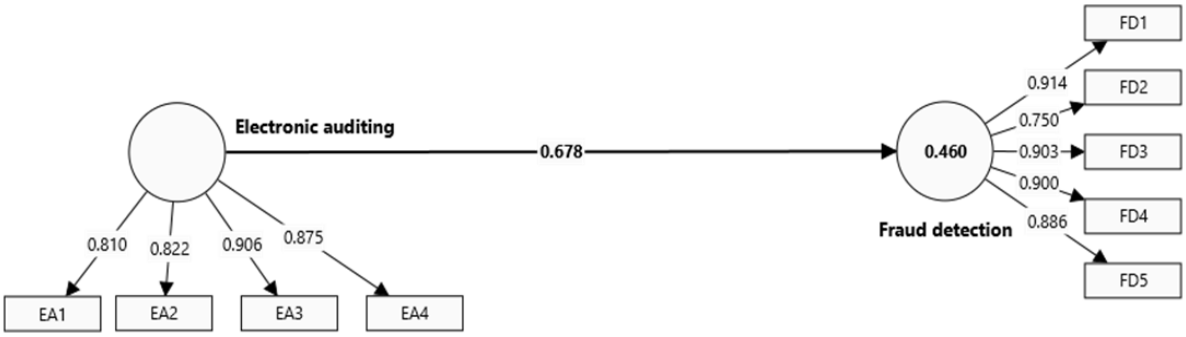

Figure 2. Testing the relationship between the independent variable and the dependent variable

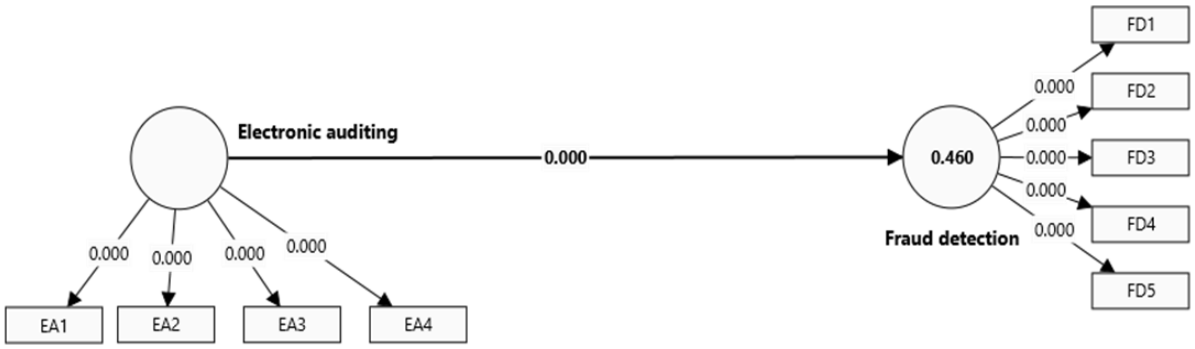

Figure 3. Testing the impact of external auditors' practice of electronic auditing on fraud detection

Figure 2 and table 8 indicate that the R-value is (0,678), which signifies a strong relationship between the external auditors' practice of electronic auditing and fraud detection. Additionally, figure 3 and table 8 show that the P-Value is (0,000), which is less than 5 %. This supports the acceptance of the study hypothesis stating that external auditors' practice of electronic auditing impacts fraud detection. This finding aligns with studies by Paranoan et al. (2022), Alassuli (2024), Dukic et al. (2023), Ljutić and Samardžić (2022), Olatunji and Adekola (2017), and Salehi and Shiri (2012).

The R-square value is (0,460), indicating that the external auditors' practice of electronic auditing explains 46 % of the variance in fraud detection. This demonstrates the independent variable's sufficient ability to explain the phenomenon.

Testing the second and third hypotheses:

H-2: External auditors' awareness of the fundamental principles of ethics for members providing forensic accounting service impact the relationship between external auditors' practice of electronic auditing and fraud detection.

H-3: External auditors' awareness of forensic accountants' skills impact the relationship between external auditors' practice of electronic auditing and fraud detection.

The predictive relevance of the model was reassessed after adding the moderating variables. The predictive relevance (Q^2) of the model increased to (0,504), as shown in the table below. This indicates an improvement in the model's quality and predictive significance.

Table 9. Structural model evaluate

P-Value	Q²predict	Adj. R-Square	R-Square	
0	0,504	0,515	0,525	Electronic Auditing Fraud detection
0				Electronic Auditing * Awareness of the Fundamental Principles of Ethics Fraud detection
0,045				Electronic Auditing * Awareness of Skills Fraud detection

https://doi.org/10.56294/dm2025664

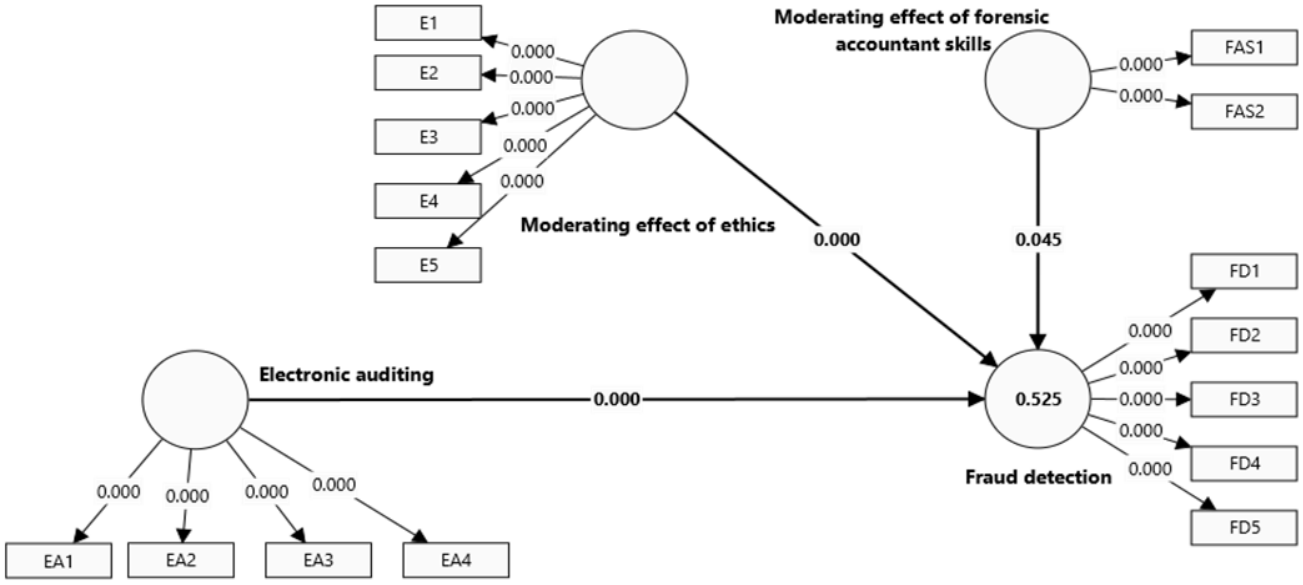

Figure 4. Testing the impact of moderating variables on the relationship between the independent variable and the dependent variable

Figure 4 and table 9 show that the P-Value is less than 5 %, with values of (0,000) and (0,045) for the first moderating variable (external auditors' awareness of the fundamental principles of ethics for members providing forensic accounting services) and the second moderating variable (external auditors' awareness of forensic accountants' skills), respectively. This indicates a positive impact of the moderating variables on the relationship between the independent and dependent variables. This means that the relationship between external auditors' practice of electronic auditing and fraud detection improves, thereby increasing the likelihood of detecting fraud cases. As a result, the second and third hypotheses are accepted, confirming that external auditors' awareness of both the fundamental principles of ethics and the skills of forensic accountants positively impact the relationship between external auditors' practice of electronic auditing and fraud detection.

Furthermore, the R-square value of the model increased to (0,525) after adding the moderating variables, compared to (0,460) before their add, representing an increase of (0,065). This improvement indicates that the model's explanatory power has become stronger. Specifically, the model now explains 52,5 % of the variance in fraud detection when external auditors practice of electronic auditing while considering their awareness of ethical principles and forensic accountant skills. The remaining 47,5 % of the variance can be attributed to other factors.

CONCLUSIONS

The study began with an introduction aiming to determine its objective of measuring the impact of external auditors' awareness of the fundamental principles of ethics for members providing forensic accounting serviceand their skills on the relationship between the external auditors' practice of electronic auditing and fraud detection. Initially, several tests were conducted to measure validity, including normal distribution,reliability; construct validity,andpredictive capabilities of the model. Secondly, the independent, dependent, and moderating variables of the study were measured. Thirdly, the study hypotheses were tested.

Data were collected using a questionnaire its distribute (267) randomly selected external auditors, retrieved (250) valid responses suitable for analysis, representing the study sample out of a total population of (521) legal external auditors practicing auditing, and the study concluded:

1. There is an impact of both external auditors' awareness of the fundamental principles of ethics for members providing forensic accounting service and their awareness of forensic accountant skills on the relationship between the external auditors' practice of electronic auditing and fraud detection. The explanatory value of the study model improved from (0,46) to (0,525) when the moderating variables were added into the relationship between the independent and dependent variables. This enhances the relationship between the independent and dependent variables, indicating that external auditors support the detection of fraud cases such as bribery, money laundering, embezzlement, and disputes and compensation cases.
2. External auditors aware the fundamental principles of ethics for forensic accountants, including integrity, objectivity, and professional competence and due care, confidentiality, and professional behavior. These results align with the Code of Ethics for Professional Accountants issued by the Professional and Ethical Standards Board 2022, indicating that external auditors are knowledgeable about what is

required when consulted for forensic accounting services, consultations, or litigation involving fraud, bribery, money laundering, embezzlement, disputes, and compensations.

3. External auditors are aware of the skills necessary for forensic accountants, including fundamental and enhanced skills. This finding corresponds with previous studies by Hopwood et al. (2012), Olabode and Moses (2023), Shakir and Thabit (2020), Davis et al. (2010), Digabriele (2008), Oyedokun (2022), Okoye and Jugu (2010), Salleh et al. (2010), Abdulrahman et al. (2020), Gray (2008), and Wijerathna and Perera (2020), this result indicates that external auditors aware the necessary skills required for performing forensic accounting tasks. This enhances their efficiency and ability to provide the most effective and beneficial forensic services.

RECOMMENDATIONS

Based on the presentation of the study and its results, we recommend that external auditors formally adopt the fundamental principles of ethics for members providing forensic accounting service and forensic accountant skills in their work. We also suggest organizing training sessions on these principles to ensure their best application during the execution of their tasks.

Additionally, we propose conducting studies on the reasons behind the low mean scores for certain aspects of external auditors' awareness of the Fundamental ethical principles and forensic accounting skills, such as oral communication skills and investigative flexibility. We also recommend examining the reasons for the low mean scores for certain ethical principles, such as the need for forensic accounting service providers to educate clients or the company they work for about professional activities, and the need for auditors to be cautious of revealing confidential information to a close business partner or immediate family member, as this could conflict with the Fundamental principles of auditing or investigations that require no connection to relatives or family. If such a conflict occurs, it would negatively impact the impartiality of the forensic accounting service provider.

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FINANCING

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

CONFLICT OF INTEREST

The authors declare no conflicts of interest regarding the publication of this paper.

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