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Audit Quality Improvement Model in the Economic Environment of Iran

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Abstract

Audit quality is one of the critical topics in the area of capital markets. Financial reporting quality plays a vital role in building trust and confidence with the users of financial statements. Achieving high-quality financial reporting depends on the accuracy of each component of the supply chain's operation. External audit, as one of the most critical components of this chain, plays a significant role in maintaining and improving the quality of financial reporting. Therefore, employing the fuzzy Delphi method and aggregating experts' opinions, this study attempts to identify the indicators of audit quality improvement and design a model suitable for the economic environment of Iran using the confirmatory factor analysis (CFA) technique. To this end, following the International Auditing and Assurance Standards Board (IAASB), 60 indicators are identified and categorized into five dimensions: A) input factors with 21 indicators, B) process factors with 10 indicators, C) output factors with 9 indicators, D) key interactions with 10 indicators, and E) contextual factors with 10 indicators. Data analysis is performed using R and AMOS software programs. The results of this study demonstrate that 54 indicators are accepted that create a model for audit quality improvement.

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1. Introduction

Financial crises in recent decades and the bankruptcy of big international companies have highlighted the importance of financial reporting quality and emphasized the role of audit quality in improving financial reporting and its credibility, and thus, enhancing users' trust and confidence in financial statements (Esplin et al., 2018; Kuang et al., 2020; Horton et al., 2021).

The accuracy of the operation of each component of the financial reporting supply chain leads to higher-quality financial reporting. One of the most critical components of this chain is external audits that, by considering the public interests, assure that the financial information presented in financial reports is fair and reliable (IAASB, 2011; Royaee et al., 2015; Imani Barandagh et al., 2016). Technological advances worldwide have led to remarkable developments in today's professional world and increased the demand for more attention to professional careers (Mojtahed Zadeh and Aghayi, 2004).

As audit quality is a complex subject, there is no universal definition of audit quality, and users are not directly able to evaluate audit quality; therefore, different proxies have been used to measure audit quality in the related literature (IAASB, 2014; El-Dyasty and Elmer, 2020; Jung et al., 2016). Although many researchers have investigated audit quality, Bing et al. (2014) state that is measuring audit quality using different proxies has been subject to the following limitations:

A: one or a few proxies have been used to measure audit quality, while a set of proxies for audit quality should be used to measure audit quality more accurately.

B: output-based proxies are more often used to measure audit quality, and these proxies per se cannot measure audit quality; thus, it is necessary to use input, process, and output factors together, adopting a systematic approach.

C: in some research, audit quality has been measured based on the perception of quality. For example, audit firm size has been used as a measure of audit quality.

Therefore, it is suggested that more realistic measures be used to accurately determine audit quality (Nikbakht and Khoshroo, 2017).

Furthermore, "key interactions within the financial reporting supply chain" and "contextual factors" can also be added to the mentioned factors to overcome the second limitation, and the systematic approach should be considered more completely in research related to audit quality improvement.

Therefore, using a holistic approach, the international auditing and assurance standards board (IAASB) published a framework for audit quality in which the main factors contributing to audit quality are introduced. The IAASB believes that the framework encourages auditors, audit firms, and stakeholders to improve audit quality in their environment. Researchers in different countries, including Iran, are expected to pay attention to the indicators suggested by the IAASB and adjust these indicators according to the context in which audit firms operate to help those involved in the financial reporting supply chain, especially auditors, improve audit quality.

Thus, conducting a study aimed at developing a model for audit quality improvement in Iran, considering the indicators suggested by the IAASB and the economic environment of Iran, to improve audit quality and enhance the position of the auditing profession in Iran is of particular importance for the following reasons:

1- The Iranian Association of Certified Public Accountants (IACPA) is a newly established institute, and conducting research that can help this institute improve audit quality is necessary;

2- Considering the large number of audit firms in Iran and the existence of intense competition among them, audit quality improvement is vital for the continued operation of these firms in the long term;

3- Considering the expansion of financial markets in Iran and the increasing need for high-quality financial information, improving audit quality is necessary;
4- Financial crises in recent decades in Iran and abroad have called into question the credibility of the auditing profession. Therefore, audit quality should be continuously improved to address this issue and improve the profession's position in society.
5- As stakeholders hold different views on audit quality, it is necessary to continue to research audit quality to consider all the different views.
6- Considering continuous changes in the business environment and information technology advances, research on audit quality improvement should be continued to adapt the auditing profession to its fast-changing environment.

Therefore, the present study can answer this question: What is Iran's audit quality improvement model?

The rest of this paper consists of four sections. Section (2) reviews the audit quality and its background and introduces the research questions. Section (3) discusses the research method. The results and findings are then presented. Finally, a research conclusion is drawn.

2. Theoretical framework

2.1. Audit quality definition:

Audit quality and its determining factors have long caught the attention and interest of investors, managers, financial analysts, researchers, and creditors, and its output has served the public interest because it helps to make good decisions on resource allocation, which is a crucial factor in increasing the efficiency of capital market (Setayesh et al., 2016). A high-quality audit meets the need of the users of financial statements for evaluating the quality of financial reports and provides a proper basis for making good economic decisions.

Audit firms need to have their audit quality confirmed by the economic environment to continue their operation in the long run (Herrbach, 2001). But what is audit quality? The IAASB believes that despite many efforts to define audit quality, there is still no comprehensive, worldwide, and consensual definition, and thus, audit quality can be introduced as a complex and multidimensional concept (Mashayekhi et al., 2013; Alavi and Vakili Fard, 2021) that cannot be limited to a simple definition and the opinions of all those involved in the financial reporting supply chain should be taken into account (Bonner, 2008; Knechel et al., 2012; IAASB, 2014; Mohammadrezaei and Faraji., 2019). Therefore, considering that audit quality is multidimensional, systems thinking on audit quality is critical because the quality of all the system’s components should be considered and systems thinking on quality is the most comprehensive approach (IAASB, 2011).

2.2. Efforts to improve audit quality:

Financial crises in recent decades have called into question the auditing profession and audit quality. Consequently, audit quality has captured the attention of regulators in leading countries. The US Sarbanes-Oxley Act (2002), the UK Financial Reporting Council (FRC) (2003), the 8th EU Directive (2008), the Canadian Public Accountability Board (CPAB) (2003), and the Australian Securities and Investments Commission (ASIC) emphasized the necessity of the existence of audit firm’ quality control system and its enhancement (Alavi et al., 2015). Moreover, Catanach (1999), Warming-Rasmussen et al. (1998), and Duff (2009) introduced and developed factors affecting audit quality by developing audit quality models.

Policymakers have also made attempts to identify key indicators of audit quality. Examples of these efforts include A) the establishment of the U.S. Department of the Treasury's Advisory Committee on the Auditing Profession aimed at developing audit quality indicators, B) the

development of "the audit quality framework" in 2008 by the UK FRC, C) the release of the report of "audit quality in Australia: a strategic review" in 2010 by the Australian Federal Treasury, and D) the preparation of a list of audit quality indicators grouped in three categories by the Public Company Accounting Oversight Board (PCAOB) in 2013 (Kilgore et al., 2011; Martin, 2013). Potential indicators developed by the PCAOB fit into three categories, A) audit inputs, which include the auditor's demographic characteristics, B) audit process, which includes the appropriateness of audit methodology, the effectiveness level of audit methods used, and the level of access to the required audit evidence, and C) audit outputs, which have significant effects on audit quality because they are considered by users while evaluating audit quality.

As a more considerable step, in 2014, the IAASB developed a framework for audit quality in which the main factors contributing to audit quality were introduced. In the introduction of this framework, it is stated that audit quality is a complex subject, and no definition or analysis of it has received general worldwide recognition. Therefore, the IAASB has published the framework above in which input, process, and output factors that improve audit quality at the audit engagement level, the audit firm level, and the national level are described for financial statement audits. Furthermore, this framework has explained the importance of proper interactions among stakeholders and contextual factors. Therefore, what makes this framework distinct and superior to other similar research outputs is that, first, it covers input, process, and output factors to a larger extent at three levels (the audit engagement level, the audit firm level, and the national level), and second, it also includes two other key factors affecting audit quality including stakeholders' interactions and contextual factors.

The IAASB has introduced the main factors contributing to audit quality in this framework and believes that following the framework in the economic environment of each country can lead to high-quality audits and improve the position of the auditing profession in society. Figure 1 depicts an overview of the IAASB audit quality framework:

In Iran, researchers including Mojtahedzadeh and Aghaei (2004), Mashayekhi et al. (2013), Alavi et al. (2015), Imani Barandagh et al. (2016), Nikbakht and Khoshroo (2017), Karami et al., (2019), Baghian et al. (2020), Delbary Ragheb et al. (2022) have attempted to identify factors influencing audit quality in the Iranian context and develop models for improving audit quality. A summary of these studies is provided in the following:

Mojtahedzadeh and Aghaei (2004) investigated factors influencing audit quality from the viewpoints of external auditors and users. The statistical population of their research comprised the users of audit services, including the managers of investment companies and the managers of the credit department of banks, and external auditors. They examined the effects of thirteen factors on audit quality and investigated the difference between users' and independent auditors' views. The results showed that respondents placed more emphasis on nine factors, and no significant difference between users' and independent auditors' views was observed.

Mashayekhi et al. (2013) designed an audit quality model. Their study investigated audit quality using a systematic approach, examining the quality of audit inputs, process, and outputs. According to their results, partners' commitment to audit quality is the most crucial contributing factor at the engagement and audit firm levels. It can improve audit quality when it is accompanied by knowledge and experience, the required facilities exist, and necessary strategies are employed. Factors such as the effective supervision of the audit engagement, the verification status of the competency of certified public accountants (CPAs), the level of support for audit firms against change and pressure, the effectiveness of the quality control system in the profession, the input and process factors influencing audit quality, and the relation of the number of audit firms to the demand for audit quality at the auditing profession level, and the retention of partners and staff, the reputation and credibility of the audit firm and partners, auditor industry specialization, the relation of audit fees to audit effort,

the size and structure of the firm, the complexity of business and transactions, and time pressure and tenure at the firm and engagement levels are the factors contributing to audit quality.

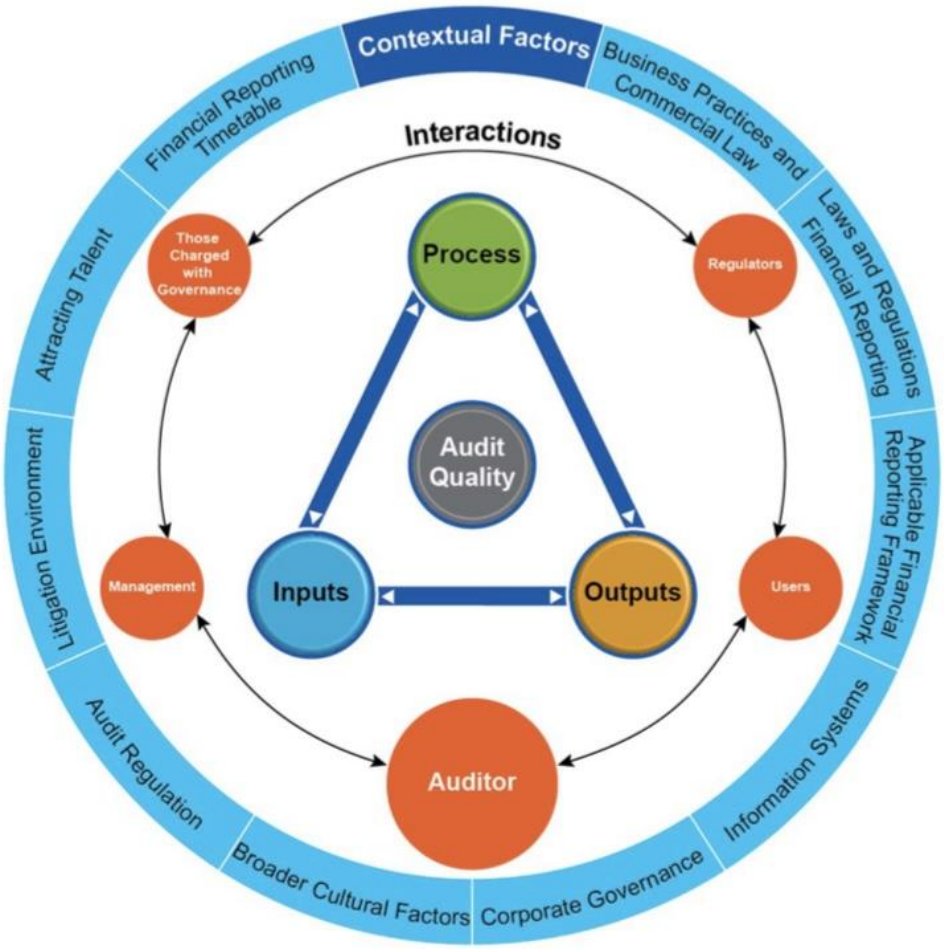

Figure 1. an overview of the IAASB audit quality framework (IAASB, 2014)

Alavi et al. (2015) investigated factors influencing audit quality in audit firms that are a member of the IACPA. They investigated the relationship between annual income, audit firm age, the number of CPAs employed, the number of professional employees, the number of engagements, the number of partners and the audit firm's quality control score. The results demonstrate a positive and significant relationship between audit quality variables such as the number of CPAs employed, the number of professional employees, and audit firm age and the audit firm's quality control score and a significant negative relationship between the number of partners and the number of engagements of the audit firm and the audit firm's quality control score.

Imani Barandagh et al. (2016) identified factors determining audit quality in Iran from the viewpoint of the CPAs and examined the three groups of audit quality indicators, including audit inputs, audit outputs, and contextual factors. Their results indicate that auditor experience and engagement performance factors (input factors), the existence of internal controls (output factors), and the existence of corporate governance (contextual factors) have the most significant effects on audit quality. Furthermore, their results demonstrate that from the viewpoint of CPAs, conducting tax audits reduces financial audit quality.

Nikbakht and Khoshroo (2017), considering the indicators of the PCAOB, investigated factors

affecting audit quality in Iran. The statistical population of their research comprises audit experts, and a system- and process-based approach to audit quality is adopted. The potential indicators presented in their study include input, process, and output factors derived from the indicators of the PCAOB. According to the results, the most significant effects on audit quality are related to indicators such as the average work experience, industry expertise, partner, manager, and quality reviewer hours relative to total audit effort, independence-related indicators and compliance, the restatement of financial statements and its effect on the market, the workload of partners and employees, excessive turnover of partners and managers.

Karami et al. (2019) designed an audit quality model based on the financial reporting supply chain, and the results obtained from their analyses indicate that factors influencing audit quality can be categorized, based on the components of the financial reporting supply chain, into main dimensions of organizational structure and governance, internal control system, professional standards and regulations on financial reporting, financial reports ' providers, the qualitative characteristics of financial statements, the competence of auditors, audit firm structure, the execution of operations and the auditor's report on financial statements, the auditing profession and market.

Baghian et al. (2020) designed an audit quality model using the Grounded Theory approach. The statistical population of their research comprises audit experts. According to the results, the most significant effects on audit quality are related to components such as regulatory changes in audit regulation, compliance with accounting standards, the qualitative characteristics of corporate governance, the behavior of users and investors, the qualitative characteristics of Preparers of financial reports, compliance with code of ethics, the behavior of auditors; and compliance with auditing standards.

Delbary Ragheb et al. (2022), considering the stakeholders' needs, investigated components of Independent audit quality. The statistical population of their research comprises audit and academic experts. According to the obtained results, 19 main components affect audit quality. These components are classified into three levels: 1) Components of audit quality at the level of users (Four components), 2) Components of audit quality at the level of audit firms (including five components), and 3) Components of audit quality at the level of auditing oversight bodies (including seven components).

Given the above explanations, this study seeks to identify the indicators of audit quality improvement in the economic environment of Iran; thus, according to the prior studies, research questions are developed as follows:

What is the audit quality improvement model in Iran?

Sub-questions:

- What are the dimensions of audit quality improvement in Iran?
- What are the components of audit quality improvement in Iran?
- What are the indicators of audit quality improvement in Iran?

3. Research Methodology

The present study is applied research in terms of purpose and descriptive survey regarding the data collection method. This study aims to identify the indicators of audit quality improvement in Iran and develop a model for audit quality improvement. To this end, the fuzzy Delphi method and the confirmatory factor analysis (CFA) technique are employed in the following steps:

a. studying the related literature: in the first step, after studying the related literature and the research background and following the IAASB audit quality framework, 60 indicators of audit quality improvement in five dimensions of inputs, process, outputs, critical interactions within the financial reporting supply chain, and contextual factors were extracted.

b. designing a questionnaire: in the second step, experts were asked to determine the importance degree of each indicator affecting audit quality improvement and score each indicator on a scale of 0-9, with 0 indicating insignificance and 9 indicating full significance.

c. experts' opinions: to achieve an opinion consensus of experts on the audit quality improvement indicators, the fuzzy Delphi method was used, which is a valid scientific and well-known method for obtaining experts' opinions.

d. creating a model using the CFA: after finalizing the indicators, using the CFA technique, the audit quality improvement model in Iran's economic environment was extracted.

3.1. Statistical population and sampling method

The statistical population of this study comprises audit experts (the partners and senior managers of audit firms that are a member of the IACPA and Iran audit organization). It should be noted the selection of the expert panel members in a Delphi study is according to three attributes: 1) diversity, 2) depth of knowledge, and 3) breadth of thinking (Harman and Press, 1975). Therefore, the expert panel members were selected using the purposive sampling technique and 80 questionnaires were distributed among the audit experts, and 58 questionnaires were collected to analyze the data.

3.2. The demographic characteristics of experts:

Education level: the majority of the respondents have a master's degree (40 people or 69 percent), 17 people (29.3 percent) have a doctoral degree, and only 1 person (a doctoral student) is in the group of others.

Career or position: 47 people (81 percent) are employed by the audit firms that are a member of the IACPA, 6 people (10.3 percent) are CPAs but are not employed, and 5 people (8.6 percent) are employed by Iran audit organization.

Teaching experience at university: 50 percent of the respondents have been educators or faculty members at university, and the other 50 percent were not academics.

Relevant professional experience: the majority of the respondents (25 people or 43.1 percent) have 11-15, 14 people (24.1 percent) have 16-20,14 people (24.1 percent) have more than 20, and 5 people (8.6 percent) have 6-10 years of relevant professional experience.

Position in the organization: 27 people (46.6 percent) are audit partners, 18 people (31 percent) are technology managers, and 13 people (22.4 percent) have a position other than these two positions.

3.3. Conceptual model

In this study, following the theoretical framework, the audit quality improvement model was designed in five dimensions: inputs, process, outputs, key interactions within the financial reporting supply chain, and contextual factors to determine the final model after obtaining experts' opinions. To this end, 60 indicators were suggested, as described in Table 1, to obtain experts' opinions:

Table 1. The 60 suggested indicators for audit quality improvement in Iran

Dimensions	Component	Indicator
Input factors	**Input factors- Values, ethics, and attitudes**	1- The engagement team performs audits in the public interest and adheres to ethical principles; 2- The engagement team has required personal characteristics; 3- A proper ethical climate is created and maintained within the firm; 4- Performance appraisal and reward systems are established; 5- Actions and decisions are not affected by financial considerations that may curtail audit quality; 6- A culture of consultation on complex issues is fostered; 7-There are strong systems for making decisions on client acceptance and continuance; 8- Partners and staff are provided with opportunities for professional development and access to the technical support of high quality; 9- Regulatory bodies provide clear underlying ethics requirements; 10-Regulatory bodies actively ensure that ethical principles are understood and applied; 11-Information relating to client acceptance is shared between audit firms.
	Input factors- knowledge, skills, experience, and time	1- Partners and staff have the required competencies; 2 - Partners and staff form reasonable judgments, and the audit engagement partner actively participates in risk assessment, planning, supervising, and reviewing the work performed; 3-Staff involved in the audit engagement have sufficient experience, and the audit engagement partner and more experienced staff properly direct, monitor, and review the work of other staff; 4- Partners and staff have adequate time to conduct the audit effectively; 5- The audit engagement partners and other experienced engagement team members have access to management and those charged with governance; 6- Partners and staff have adequate time to address complex issues; 7- The audit engagement team is properly structured. Partners and more experienced staff provide less experienced staff with on-the-job training and timely assessments; 8- Partners and staff are provided with adequate training on accounting, audit, and the industry in which the audit client operates; 9- Audit firms and individual auditors are licensed provided that they satisfy certain robust requirements; 10- There is a clear definition of education requirements, and training is sufficiently provided. There are proper arrangements to update partners and staff on current issues continuously.
Process factors	**audit process and quality control procedures**	1- The audit is performed per relevant laws and regulations, auditing standards, and the quality control procedures of the audit firm; 2-The engagement team effectively utilize information technology; 3-The engagement team members interact with each other effectively and make proper arrangements with management exist in order to perform the audit effectively and efficiently; 4- The audit methodology is adapted to changes in professional standards and findings obtained from conducting internal quality control reviews and external inspections; 5-The audit methodology promotes the exercise of professional skepticism and appropriate professional judgment; 6- The audit methodology requires that audit work be effectively supervised and reviewed and audit documentation be prepared sufficiently; 7- Proper quality control procedures are established to monitor audit quality, and proper consequential action is taken. Effective quality control reviews are conducted at the engagement level when necessary; 8- Standard setters clarify the primary objectives of auditing and other standards; 9- Relevant audit quality attributes are considered by bodies in charge of external audit inspections at the audit firm and engagement levels; 10- There are effective systems for examining allegations of audit failure and, when appropriate, taking disciplinary action.
Output factors	**reports- engagement level**	1- Presenting the audit report in more detail to provide greater assurance; 2- Preparing written reports by the auditor to those charged with governance to improve the financial reporting process and the internal control system and to help them fulfill their governance responsibilities more effectively; 3-Presenting reports to financial and prudential regulators on matters they consider to be of material significance and illegal acts, e.g., money laundering; 4- Increasing the compatibility between auditor report and quality of the audited financial statements; 5- Presenting more information in the annual reports concerning the activities of audit committees regarding the independent audit; 6- Reporting the findings of the inspections of audit engagements to audit committees.
	reports- firm level and national level	1- Preparing transparency reports to provide the public with information on the audit firm's quality control procedures and its governance; 2- Providing annual reports by audit firms on solutions for improving audit quality; 3- Increasing the level of details presented in the reports of regulators on the findings of their inspections of audit firms to the public

Key interactions within the financial reporting supply chain	**interactions**	1- Developing an open and constructive relationship between the auditor and management while applying objectivity and professional skepticism; 2- Establishing a two-way communication between auditors and those charged with governance; 3- Increasing the level of effective relationships between auditors and users to enhance the users' understanding of audit quality and auditors' awareness of users' expectations; 4- Increasing the level of effective communications between auditors and regulators to facilitate the legislative process, provide more effective supervision, and coordinate their activities to improve audit quality; 5- Increasing the level of effective interactions between the management and those charged with governance to conduct audits of higher quality; 6- Increasing the level of effective interactions between the management and regulators to improve the management's understanding of financial reporting standards, and thus, reduce the disagreements between the management and auditors; 7- Increasing the level of interactions between the management and users to improve the users' understanding of the quality of financial statements, thereby increasing their understanding of audit quality; 8- Increasing the level of interactions between those charged with governance and regulators to enhance audit quality and their awareness of each other's expectations to improve the legislative and supervisory process; 9- Increasing the level of interactions between those charged with governance and users to improve the users' understanding of audit quality; 10- Increasing the level of interactions between regulators and users to enhance the users' understanding of the quality of the services provided by audit firms.
Contextual factors	**environmental factors**	1- Updating the commercial law to improve the corporate governance and reduce fraud opportunities and errors; 2- Updating rules and regulations on financial reporting to reduce fraudulent financial reporting and increase the cooperation between management and auditors; 3- Enhancing the transparency of the financial reporting framework to increase the management's understanding of it and auditors' awareness of the management's decisions, judgments, and estimations; 4- Improving and updating information systems to support high-quality financial reporting and enhancing the auditors' knowledge of these systems; 5- Improving corporate governance mechanisms to enhance financial reporting and audit quality; 6- Fostering the spirit of cooperation in the engagement team and increasing the level of interactions between the upper and lower levels of the audit team, and encouraging the team to exercise professional skepticism throughout the audit; 7- Increasing the effectiveness of licensing, standard-setting, and audit quality control processes and taking disciplinary actions in the case of audit negligence; 8- Increasing the litigation risk to a balanced level and holding auditors legally liable for the damages to stakeholders in the case of audit negligence; 9- Increasing the society's understanding of the audit and its capabilities and improving the status of the profession to attract individuals with the required qualities; 10- Setting financial reporting periods in a way that reduces the time pressure on auditors.

3.4. Obtaining experts' opinions (the fuzzy Delphi method) and presenting a model (the CFA)

In this study, first, using the fuzzy Delphi method, the indicators confirmed by experts were extracted. Out of the two applications of the fuzzy Delphi method (forecasting and screening), the fuzzy Delphi method was used for screening indicators. In screening, first, according to the prior research, the initial screening is performed, and the analysis has a confirmatory aspect. In contrast to the fuzzy Delphi method for forecasting (which has to continue for multiple rounds to obtain experts' consensus), this screening method can be performed in a single round (Babajani et al., 2018). In the first step of performing the fuzzy Delphi method, a proper fuzzy spectrum should be developed for fuzzifying the linguistic expressions of the respondents. To this end, experts' opinions were collected, and the data were converted from responses within a range of 0-9 to a 5-point scale from very unimportant to very important. Then, based on the table below, the values were fuzzified.

This study used triangular fuzzy numbers because they are easy to calculate and widely used in research. The experts presented their opinions in the smallest possible, the largest possible, and the most probable values (triangular numbers) (Ataei, 2010). In the next step, using the weighted average defuzzification method, experts' opinions were collected, and then, the obtained values were defuzzified, and the weight of each indicator was calculated. Considering that, in screening indicators, a threshold must be set, and if the calculated weight for an indicator is greater than the threshold, the indicator is confirmed. Therefore, in this study, following Wu and Fang (2011) and Babajani et al.

(2018), the set threshold was 0.7.

Table 2. The fuzzification of values (Martínez-Noya and García-Canal, 2011)

Linguistic expressions	very unimportant	unimportant	moderately Important	important	very important
Triangular fuzzy numbers	(0, 0, 0.25)	(0, 0.25, 0.5)	(0.25, 0.5, 0.75)	(0.5, 0.75, 1)	(0.75, 1, 1)
Crisp value	1	2	3	4	5

After performing the fuzzy Delphi method and aggregating experts' opinions on the factors affecting audit quality improvement, the CFA technique was used to analyze the data and design a model. In the first step, the measurement models were fitted, and in the next step, the model fit indices were used to evaluate the fit of the models. It should be noted that to improve the fit of the measurement model, corrections were made to the model by adding the covariance-based relationships between the model's errors. Then, each construct was tested for validity and reliability. After confirming the fit of the measuring models, the structural model was examined, and then again, using the model fit indices, the structural model was examined. It should be noted that after fitting the measurement models, their factor loadings were calculated; thus, indicators having factor loadings greater than 0.5 were removed from the analysis process for being irrelevant. In this study, data analysis was performed using R and AMOS software programs.

4. Findings

4.1. The importance level of the research indicators based on experts' opinions (the results obtained from the fuzzy Delphi method)

The defuzzified output of the values obtained using the fuzzy Delphi method is presented in Figure 1. As indicated, experts have agreed on these indicators strongly, and all the defuzzified numbers are greater than 0.7. Therefore, according to the obtained results, no indicator is removed, and all the indicators play a role in improving audit quality in Iran and are confirmed by experts.

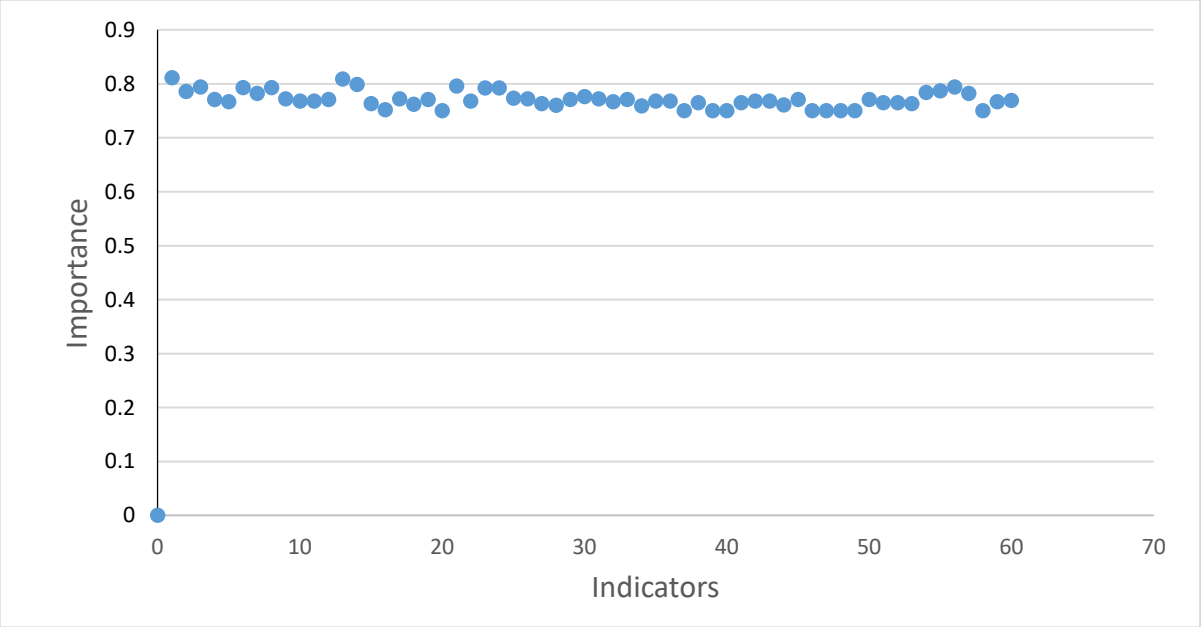

Figure 2. The importance level of the research indicators based on experts' opinions

4.2. Audit quality improvement model

The CFA technique was used in the next step to extract the final research model. To this end, the first-order one-factor CFA model related to audit quality improvement was fitted, and after removing items with factor loadings less than 0.5, 54 indicators remained. Then, the remained indicators were fitted in the second-order one-factor CFA model as described in Figure 2, in which all the 54 indicators of audit quality improvement had a factor loading greater than 0.5; thus, they were all accepted as described in the conceptual model in the next page, and the final research model, which is a model for improving audit quality in the economic environment of Iran, was formed as described in Figure 2. Moreover, the accepted indicators of each dimension and the constructs of the final model are presented in Tables 3-9.

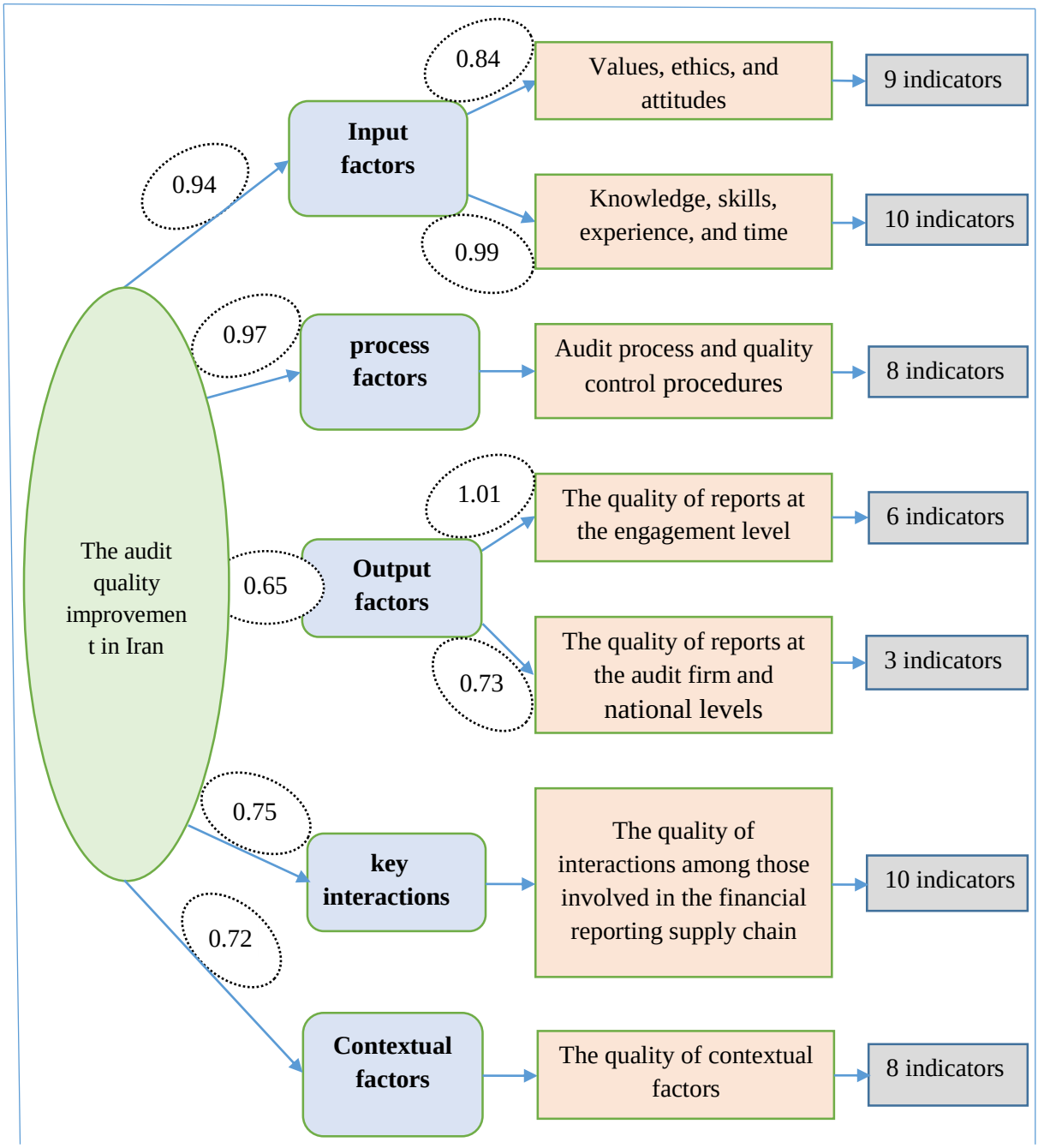

Figure 3. The audit quality improvement model in the economic environment of Iran

4.3 The final indicators of each component and the related factor loadings

Table 3. Final indicators of the component of values, ethics, and attitudes and the factor loading of each indicator- the dimension of input factors

Component	Factor loading	Indicator
Values, Ethics, and Attitudes	0.62	The engagement team has required personal characteristics
	0.73	A proper ethical climate is created and maintained within the firm
	0.64	Performance appraisal and reward systems are established
	0.58	Actions and decisions are not affected by financial considerations that may lower audit quality
	0.72	A culture of consultation on complex issues is fostered
	0.72	There are strong systems for making decisions on client acceptance and continuance
	0.81	Partners and staff are provided with opportunities for professional development and access to the technical support of high quality
	0.51	Regulatory bodies provide clear underlying ethics requirements
	0.53	Regulatory bodies actively ensure that ethical principles are understood and applied

Table 4. Final indicators of the component of knowledge, skills, experience, and time, and the factor loading of each indicator- the dimension of input factors

Component	Factor loading	Indicator
Knowledge, Skills, Experience, and Time	0.74	Partners and staff have the required competencies
	0.78	Partners and staff form reasonable judgments, and the audit engagement partner actively participates in risk assessment, planning, supervising, and reviewing the work performed
	0.73	Staff involved in the audit engagement have sufficient experience, and the audit engagement partner and more experienced staff properly direct, monitor, and review the work of other staff.
	0.83	Partners and staff have adequate time to conduct the audit effectively
	0.64	The audit engagement partners and other experienced engagement team members have access to management and those charged with governance
	0.75	Partners and staff have adequate time to address complex issues
	0.85	The audit engagement team is properly structured. Partners and more experienced staff provide less experienced staff with on-the-job training and timely assessments
	0.74	Partners and staff are provided with adequate training on accounting, audit, and the industry in which the audit client operates
	0.59	Audit firms and individual auditors are licensed, provided that they satisfy specific robust requirements
	0.78	There is a clear definition of education requirements, and training is sufficiently provided. There are proper arrangements to update partners and staff on current issues continuously.

Table 5. Final indicators of the component of the audit process and quality control procedures and the factor loading of each indicator- the dimension of process factors

Component	Factor loading	Indicator
Audit processes and quality control procedures	0.78	The audit is performed by relevant laws and regulations, auditing standards, and the quality control procedures of the audit firm
	0.76	The engagement team effectively utilizes information technology
	0.92	The engagement team members interact with each other effectively, and proper arrangements with management exist
	0.68	The audit methodology is adapted to changes in professional standards
	0.81	The audit methodology promotes the exercise of professional skepticism
	0.62	The audit methodology requires that audit work be effectively supervised and reviewed and audit documentation be prepared sufficiently
	0.74	Proper quality control procedures are established to monitor audit quality
	0.70	Standard setters clarify the primary objectives of auditing and other standards

Table 6. Final indicators of the component of the quality of reports at the engagement level and the factor loading of each indicator- the dimension of output factors

Component	Factor loading	Indicator
The quality of reports at the engagement level	0.59	Presenting the audit report in more detail to provide greater assurance
	0.67	Preparing written reports by an auditor to those charged with governance
	0.75	Presenting reports to financial and prudential regulators on matters they consider to be of material significance
	0.80	Increasing the compatibility between auditor reports and the quality of the audited financial statements
	0.76	Presenting more information in the annual reports concerning the activities of audit committees
	0.75	Reporting the findings of the inspections of audit engagements to audit committees

Table 7. The final indicators of the component of the quality of reports at the audit firm and national levels and the factor loading of each indicator- the dimension of output factors

Component	Factor loading	Indicator
The quality of reports at the audit firm and national levels	0.80	Preparing transparency reports to provide the public with information on the audit firm's quality control procedures and its governance
	0.84	Providing annual reports by audit firms on solutions for improving audit quality
	0.74	Increasing the level of detail presented in the reports of regulators on the findings of their inspections of audit firms to the public

Table 8. Final indicators of the component of key interactions within the financial reporting supply chain and the factor loading of each indicator- the dimension of key interactions

Component	Factor loading	Indicator
The key interactions within the financial reporting supply chain	0.79	Developing an open and constructive relationship between the auditor and management while applying objectivity and professional skepticism
	0.78	Establishing a two-way communication between auditors and those charged with governance
	0.79	Increasing the level of effective relationships between auditors and users to enhance the users' understanding of audit quality
	0.77	Increasing the level of effective communication between auditors and regulators to facilitate the legislative process and provide more effective supervision
	0.78	Increasing the level of effective communications between the management and those charged with governance to conduct audits of higher quality
	0.84	Increasing the level of effective communication between the management and regulators to improve the management's understanding of financial reporting standards
	0.81	Increasing the level of interactions between the management and users to improve the users' understanding of the quality of financial statements
	0.74	Increasing the level of interactions between those charged with governance and regulators to enhance audit quality
	0.76	Increasing the level of interactions between those charged with governance and users to improve the users' understanding of audit quality
	0.73	Increasing the level of interactions between regulators and users to enhance the users' understanding of the quality of the services provided by audit firms

Table 9. Final indicators of the component of contextual factors and the factor loading of each indicator- the dimension of contextual factors

Component	Factor loading	Indicator
Contextual factors	0.81	Updating rules and regulations on financial reporting to reduce fraudulent financial reporting
	0.86	Enhancing the transparency of the financial reporting framework to increase the management's understanding
	0.79	Improving and updating information systems to support high-quality financial reporting
	0.73	Improving corporate governance mechanisms to enhance financial reporting and audit quality
	0.64	Fostering the spirit of cooperation in the engagement team and increasing the level of interactions between the upper and lower levels of the audit team
	0.61	Increasing the effectiveness of licensing, standard-setting, and audit quality control processes and taking disciplinary actions in the case of audit negligence.
	0.57	improving the status of the auditing profession to attract individuals with the required qualities
	0.64	Setting financial reporting periods in a way that reduces the time pressure on auditors

4.4. The model fit indices

Researchers use the model fit indices to assess the hypothesized fitted model with the observed data. The Chi-square statistic is the most commonly used fit index that indicates the importance of the difference between the fitted model's covariance matrix and the observed sample's covariance

matrix. It should be noted that this index is affected by the sample size. An increase in the sample size leads to a reduced difference, which shows the goodness of fit. Thus, to address this issue, the Chi-square divided by the degree of freedom is used in addition to other model fit indices, including the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), the comparative fit index (CFI), the Tucker–Lewis index (TLI), and the root mean square error of approximation (RMSEA). It should be noted that the GFI, CFI, and TLI should have values greater than 0.9 (Hooman, 2013), the AGFI should have a value greater than 0.8 (Hair et al., 2010); the Chi-square divided by the degree of freedom should have a value between 1-3 (Mohsenin and Esfidani, 2013), and the RMSEA index should have a value less than 0.1 (Myers et al., 2005). Therefore, considering these values, the table below (Table 10) indicates that almost all the indicators are generally in the acceptable range. Therefore, it can be argued that these items can create a proper construct, i.e., audit quality.

4.5. Testing the validity and reliability of the model

The composite reliability index was used to test the reliability. The reliability indicates the same perception of questions among the different respondents. Notably, a construct with a composite reliability coefficient greater than 0.6 has good reliability. The average variance extracted (AVE) was used to assess the validity. It should be noted that a construct is valid, provided that its AVE value is greater than 0.4 (Taghavi Fard et al., 2011). Therefore, considering the results presented in Table 11, the constructs have good validity and reliability.

Table 10. The model fit indices of the measurement model

Model	χ^2/df	GFI	AGFI	CFI	TLI	RMSEA
Values, ethics, and attitudes	1.25	0.89	0.801	0.968	0.95	0.067
Knowledge, skills, experience, and time	1.15	0.89	0.82	0.986	0.98	0.050
Process factors	1.29	0.93	0.82	0.986	0.973	0.07
The quality of reports at the engagement level	1.13	0.94	0.87	0.99	0.98	0.047
The quality of the reports at the audit firm and national levels	-	1.000	-	1.000	-	0. 61
Key transactions within the financial reporting supply chain	1.67	0.864	0.712	0.961	0.932	0.1
Contextual factors	1.09	0.935	0.844	0.995	0.990	0.04
The second-order measurement model	1.63	0.741	0.754	0.729	0.842	0.099

Table 11. The results of testing validity and reliability

Model	AVE	CR
Values, ethics, and attitudes	0.43	0.89
Knowledge, skills, experience, and time	0.56	0.91
Process factors	0.57	0.88
The quality of reports at the engagement level	0.52	0.86
The quality of reports at the audit firm and national levels	0.63	0.75
Key interactions within the financial reporting supply chain	0.61	0.91
Contextual factors	0.51	0.88

5. Discussion and Conclusion

Audit quality and its contributing factors have long captured the attention and interest of investors, researchers, financial analysts, creditors, and managers. Financial crises in the recent decades in Iran and abroad have led to the bankruptcy of big companies, such as Enron, WorldCom, and Tyco, and called into question the accounting and auditing profession, while the objective of external audit is to provide the users of financial statements with assurance about the credibility of financial statements. To achieve high-quality financial reports, each component of the financial reporting supply chain

should function properly. External audit, one of the components of this chain, plays a major role in maintaining and improving the quality of financial reporting. Undoubtedly, the information revolution has significantly affected life and working style and significantly changed today's business and professional world. Globalization has affected different professions and has increased the need for greater attention to the outputs of professional careers. Consequently, we can no longer rely on traditional systems and methods, and the auditing profession is no exception. Therefore, considering the recent changes in the auditing profession in Iran, the young age of the IACPA, the establishment of a large number of audit firms that are a part of the IACPA, the existence of intense competition among these firms, the expansion of financial markets, and the increasing need for reliable financial information, it is necessary to continue researching factors influencing audit quality in Iran because the auditing profession should adapt to the rapid changes in the environment, the advances in information technologies and the changing business and professional world. Therefore, audit quality improvement factors and models should be continuously identified and developed. Thus, the present study was conducted following the audit quality framework of the IAASB, which is responsible for setting international standards on auditing and assurance for adding to the literature on audit quality improvement in the economic environment of Iran.

This study, using the fuzzy Delphi method and obtaining the opinions of 58 experts, seeks to identify audit quality improvement indicators and design a model suitable for the economic environment of Iran. To this end, based on the theoretical framework, 60 indicators were collected and categorized into five dimensions: a) input factors with 21 indicators, b) process factors with 10 indicators, c) output factors with 9 indicators, d) key interactions within the financial reporting supply chain with 10 indicators, and e) contextual factors with 10 indicators. Data analysis was performed employing the fuzzy Delphi method and the CFA technique using R and AMOS software programs. The results show that 54 out of 60 indicators in five separate dimensions are accepted, representing the model for audit quality improvement in the economic environment of Iran according to experts' opinions as described in the model above (Figure 2). The results of the data analysis show that out of the 21 indicators of the dimension of input factors, 19 indicators were accepted, and this dimension, with a factor loading of 0.94, ranked second in the five dimensions of audit quality improvement in the order of importance. The only indicators that had low factor loadings and did not play an important role in improving audit quality based on experts' opinions were a) Information relating to client acceptance is shared between audit firms and b) performing the audit in the public interest, which are not observed in the final model.

Out of 10 indicators of the dimension of process factors, only two indicators were not accepted: a) relevant audit quality attributes are considered by bodies in charge of external audit inspections at the audit firm and engagement levels, and b) effective systems exist for examining allegations of audit failure and, when appropriate, taking disciplinary action. Moreover, with a factor loading of 0.97, this dimension is in the first rank of the five dimensions of audit quality improvement in order of importance.

Moreover, all the indicators of the dimension of output factors were agreed upon by the experts; however, this dimension with the lowest factor loading (0.65) was in the last rank of the dimensions of audit quality improvement. All the indicators of the dimension of key interactions within the financial reporting supply chain were accepted. With a factor loading of 0.75, this dimension ranked third in the dimensions of audit quality improvement in the order of importance. Lastly, out of 10 indicators of the dimension of contextual factors, only two indicators were not accepted: a) updating the commercial law to improve corporate governance and reduce fraud opportunities and errors and b) increasing the litigation risk to a balanced level and holding auditors legally liable for the damages to stakeholders in the case of audit negligence. With a factor loading of 0.72, this dimension ranked

fourth in the dimensions of audit quality improvement in the order of importance.

In addition to the fact that the results of this research are in line with the findings of the previous studies conducted on audit quality indicators in IRAN (including Mojtahedzadeh and Aghaei (2004), Mashayekhi et al. (2013), Alavi et al. (2015), Imani Barandagh et al. (2016), Nikbakht and Khoshroo (2017), Karami et al., (2019), Baghian et al. (2020), Delbary Ragheb et al. (2022)), it can be considered as their complementary research by introducing further audit quality indicators in the economic environment of Iran.

Given the results of the present study, the following suggestions are offered for future research:

1. Investigating the practical implementation of the indicators of this model in the economic environment of Iran, or in other words, examining the gap between the audit quality environment in Iran and the ideal environment extracted from this study

2. Examine the feasibility of implementing the indicators of this study's final model in Iran's economic environment.

3. Exploring the existing barriers to the practical implementation of the indicators of the final model of this study in Iran and suggesting effective solutions for overcoming these barriers and implementing these indicators more effectively in order to improve the position of the auditing profession in the economic environment of Iran.

This study provides a basis for conducting further research on the improvement of audit quality and helps those involved in the financial reporting supply chain improve audit quality and the position of the auditing profession in society.

It should be noted that there is no major limitation in this study; however, since this study uses a questionnaire, the inherent limitations are inevitable.

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