
Risk management maturity enhancement in healthcare through the application of quality management principles

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Abstract: The importance of adequate risk management is growing, whereas, Quality management unifies all managerial processes to direct and manage activities toward the achievement of organizational goals. The goal of this study is to validate the relevance of the link between the application of quality management principles and risk management maturity. This paper constitutes literature review and an analysis of the latest scientific articles, published in International databases, and other scientific sources over a period of 15 years. In summary, organization can attain a higher level of risk management maturity through the synergistic application of all seven quality management principles. The findings practically are beneficial for all types of organizations that seek to successfully implement risk management processes.

Keywords: quality management principles; risk management; risk management maturity; quality management; ISO 9000; Total Quality Management; quality in healthcare; patient safety.

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1 Introduction

Since all organizations face uncertainty caused by internal and external factors (ISO, 2018), risk management in the quality field makes a contribution to decision-making as a scientific and practical tool (Boboia, 2019). Moreover, the necessity to develop adequate risk and error management in our everyday work emerges due to constantly happening human-caused errors (Bienzeisler et al., 2020). An organization with high-risk maturity recognizes the importance of reviewing and improving weak points within risk management

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(Perrenoud et al., 2021; Wibowo and Taufik, 2017). Risk management is described as “coordinated activities to direct and control an organization with regard to risk” (ISO, 2018), whereas Quality management, as a process-oriented system (Kim-Soon et al., 2020), unifies all managerial processes to direct and manage activities toward the achievement of organizational goals (Els et al., 2021), hence both managerial methodologies in a cause-effect relationship can consolidate their impact.

The scope of this article constitutes an analysis of two management methodologies – that is, Quality Management Principles and Risk Management Maturity. Both the scientific and practical relevance of this conceptual topic is based on plenty of the latest scientific articles concerning those concepts. The focus of this paper is concentrated on the following primary questions regarding the scientific problem at the theoretical level: What are the benefits of the application of quality management principles in an organization? How the application of quality management principles can contribute to achieving a higher level of risk management maturity in healthcare? Considering the dearth of research attendant to the second question, this present paper sheds light on the relevance of the link between the application of quality management principles and risk management maturity, providing theoretical insights to the healthcare sector to address this phenomenon. The goal of this study is to validate the importance of the link between the application of quality management principles and risk management maturity in healthcare. This applied research methodology, including literature review and the critical analysis of the latest scientific articles, points to the implications of the quality management principles for the achievement of a higher level of risk management maturity. This paper constitutes an analysis of the latest scientific articles, published in International databases (Web of Science and Scopus), and other scientific sources over a period of 15 years (2007–2022), covering the research conducted on the topic of healthcare quality, the application of quality management principles, risk management, risk management maturity, and the link between them, using the keywords Quality Management Principles, Risk Management, Risk Management Maturity, Quality Management, ISO 9000, Total Quality Management, Quality in healthcare, Patient Safety.

2 The concept of Risk Management and Risk Management Maturity

Risk is a concept linked to many fields and is intrinsic to human activity (Mouras and Badri, 2020). According to ISO 9000 standard risk is defined as an “effect of uncertainty”. Additionally, risk is often described by reference to potential events and consequences, or a combination of both, and is often specified in terms of a combination of the consequences of an event and the associated probability of occurrence (ISO, 2015). In addition, a term ‘risk’ is interpreted in detail as “effect of uncertainty on objectives”, where ‘an effect’ refers to a deviation from the expected, resulting in opportunities and threats (ISO, 2018). Similarly, business risk is defined as the set of potentially negative, as well as positive effects, occurring in a company due to an unexpected event of a technological, economic, financial, asset, or reputation nature (Settembre-Blundo et al., 2021). From an academic point of view, neither a unitary definition of risk has been established, nor a coherent theory of risk has been developed (Crovini, 2019). The concept of risk does not possess a unified and shared definition and, from the methodological viewpoint, both approaches (i.e. quantitative and qualitative) are used (Settembre-Blundo et al., 2021).

Managing risks is a part of all activities related to an organization (ISO, 2018), therefore the importance of adequate risk management is growing (van Steenberghe et al., 2020). Since all organizations face uncertainty caused by internal and external factors (ISO, 2018), risk management in the quality field makes a contribution to decision-making as a scientific and practical tool (Boboia, 2019). The origins of risk have changed and become more interconnected, forming business contexts more complex (Settembre-Blundo et al., 2021). The necessity to develop adequate risk and error management in our everyday work emerges due to constantly happening human-caused errors (Bienzeisler et al., 2020). The concept of risk management is described as “coordinated activities to direct and control an organization with regard to risk”. The creation and protection of value, improving performance, and encouraging innovation are primary goals of risk management (ISO, 2018). Limitation of risk management to an accountability function, perceived as risk management emphasizing avoiding blame, leads to a dysfunctional situation, arising from reliance on legislative requirements for managing risks (Mahama et al., 2020). Specialists are exploring continually the methods of decreasing the time and cost and thus improving the effectiveness of the risk management process (Mouras and Badri, 2020). A full risk management function can become a value-adding resource in the strategic planning process (Settembre-Blundo et al., 2021). It should be emphasized that risk management should comprise all processes of the organization, adopting systematic approach (Abrams et al., 2007; Araújo and Gomes, 2021). Moreover, opportunities as another facet of risk, aside from possible and unavoidable threats (Rana et al., 2019), if well integrated into business processes, can facilitate the reduction of the negative outcomes of crucial situations and contribute to the recovery (Settembre-Blundo et al., 2021). Monitoring environmental changes that trigger threats, as well as opportunities, allows an organization to respond appropriately and anticipate risks (Mahama et al., 2020). Safety and risk management includes preventing errors, identifying and eliminating non-conformities before they become an adverse event, analysing the causes and consequences of errors and providing feedback (Bubnienė and Ruževičius, 2010). The structure of the risk management system covers processes and systems developed by the management which ensure the integration of its risk attitude in the daily activities of the organization (Araújo and Gomes, 2021). Although various international risk management standards and guidelines have widely explored and described the processes of risk management by use of different terminology, they are mainly divided into six processes: risk management planning, risk identification, risk analysis, risk response planning, implementation of risk responses, and risk monitoring (Roghabadi and Moselhi, 2020). All in all, since managing risks is a fundamental part of all activities related to an organization, risk management should involve all processes of the organization, enabling an organization to respond appropriately to change (Bucké et al., 2022). Moreover, a fully performed risk management function through the adoption of a systematic approach can turn a value-adding resource. Decision-making is influenced by external and internal factors, which managed as risks, can bring both unavoidable threats and opportunities.

A risk management maturity evaluation carried out at the early stage of risk management process identifies potential strengths and weaknesses of the organization in risk management processes as well as the performance level of the organization in its risk management (Berrada et al., 2021; Cavalcante de Souza Feitosa et al., 2021; Čech and Januska, 2020; Hoseini et al., 2019; Karunarathne and Kim, 2021; Perrenoud et al., 2021; Proença et al., 2017; Roghabadi and Moselhi, 2020; Shah et al., 2009; Škec et al., 2014; Yeo et al., 2016; Yudatama and Sarno, 2015; Zhao et al., 2013; Zhao et al., 2014). Risk

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management maturity portrays the sophistication of risk management implementation (Farrell and Gallagher, 2014; Škec et al., 2014; Zhao et al., 2014). The higher the level of maturity, the higher are the anticipated benefits of risk management. Hence the progress in risk management maturity is reasoned by the growing awareness of the business benefits potentially gained by effective risk management (Wieczorek-Kosmala, 2014). Different maturity levels are characterized by the attributes defining the level of progress (Tubis and Werbińska-Wojciechowska, 2021). An organization with high-risk maturity recognizes the importance of reviewing and improving weak points within risk management (Perrenoud et al., 2021; Wibowo and Taufik, 2017). Enterprise risk management maturity indicates the state of being complete, involving risk across the organization's value chain, and covering both strategic and processual dimensions. As a result, the more mature risk management the better service delivery (Mahama et al., 2020). Organizational maturity can be conceptualized by validating the state of perfection of an organization (Wibowo and Waluyo, 2015). The maturity model ascertains the current state of an organization, which depends on the method it operates, the opportunity to use its resources or previous experience, and the goals that can be achieved in the future by placing priorities for actions and identifying the ways for their implementation (Tubis and Werbińska-Wojciechowska, 2021). Maturity in the context of risk management refers to an evolution towards full development and application of the risk management process (Proença et al., 2017). Characterized by close linkage with continuous improvement, risk management maturity reflects the degree of formality and application of risk management activities (Hoseini, et al., 2019). To sum up, risk management maturity can be defined as the level at which an organization has implemented relevant risk management practices. Therefore, the higher the level of implementation of risk management practices, the higher the maturity level of risk management. Moreover, risk management maturity assessment can be perceived as SWOT analysis, or situational analysis, since it allows to determine potential strengths, weaknesses, opportunities, and threats.

3 Quality and Quality Management Principles

3.1 Quality in Healthcare

Systematic literature review in the context of the quality concept in healthcare contributed to the formulation of the definition of quality in healthcare, that is – providing effective and safe healthcare based on a culture of excellence, which results in optimal desirable health conditions (Allen-Duck et al., 2017). The National Academy of Medicine has presented an extended definition of the quality concept in the context of healthcare: the 'degree by which health care for individuals and society increases the likelihood of obtaining the desired health condition using current professional knowledge' (Institute of Medicine, 2013). Almost the same definition of quality in healthcare is provided by World Health Organization (WHO): 'the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with evidence-based professional knowledge' (World Health Organization, 2021). According to the Quality standard EN ISO 9000:2015, the term 'quality' is defined as 'the degree to which a set of features of an object conforms to the requirements'. WHO emphasizes improving conditions of the health system that characterize the quality of healthcare

service: effective, safe, people-centred, timely, equitable, integrated and efficient (World Health Organization, 2021). EN ISO 9001:2015 standard for healthcare set eleven quality requirements for healthcare organizations based on the clinical experience of healthcare institutions that are assumed to provide good quality healthcare, that is: appropriate and correct care, availability, continuity of care, effectiveness, efficiency, equity, evidence/knowledge-based care, patient-centered care, patient involvement, patient safety, timeliness/ accessibility (European Committee for Standardization, 2016). An examination of the theoretical aspects of applying the concept of quality in healthcare revealed that quality healthcare services, as defined by the quality standard, World Health Organization and other organizations, and scientific articles are defined as: accessible, effective, efficient, safe, patient-centered, appropriate, equitable, evidence-based, timely, and involving the patient in the treatment process and decision making (Bucké et al., 2020).

3.2 The Concept of Quality Management Principles

Today quality is appreciated not as a goal, but rather as a method of the entire organizational functioning (Kokot-Stępień, 2021). The benefits of Total quality management are manifested in several aspects, such as improving the quality and efficiency of services (Permana et al., 2021; Sin et al., 2021), adapting to changes, meeting quickly patient needs, and enabling workers to actively participate in work processes and decision-making (Sahputra et al., 2021), increasing the perceived value of customers (Kosinskienė and Ruževičius, 2010; Sin et al., 2021) and the level of employee satisfaction (Khdour et al., 2021). Quality regulation in the healthcare sector is based on accreditation, certification, quality monitoring, patients rights, standard operating processes, and healthcare quality standards (Zima, 2017). The implementation of a quality management system has proven to considerably improve the aims of the management team in any organization (Dubey et al., 2022). The application of Total quality management in various service areas allows providing clients with reliable, specific, accessible, timely, and relevant resources (Sahputra et al., 2021). Despite that, healthcare tends to be the most researched industry regarding total quality management implementation (Zhang et al., 2021). It is a comprehensive quality management system that requires the involvement of all organizational stakeholders (Khdour et al., 2021) as well as all individuals of the organization (Thao and Tu, 2021) since lack of support from employees at the planning stage of implementation of change initiatives may cause resistance to change (Almaamari et al., 2020; Keenan and Rostami, 2021). Quality management is perceived as the management of an organization, making quality a focus of attention (Anttila and Jussila, 2021). ISO 9001 certification as a beneficial initiative (Gremyr et al., 2021) has been commonly used as an indicator of total quality management (Kosinskienė and Ruževičius, 2010; Para-González and Mascaraque-Ramírez, 2018). Quality management in a holistic sense is called a process-oriented system (Kim-Soon et al., 2020), perceived as a commonality of its interconnected practices (Augustyn et al., 2021). Quality management provides an integrated system that unifies all managerial processes to direct and manage activities toward the achievement of organizational goals (Els et al., 2021). The basis of the quality management system model consists of a set of fundamental principles close to those that support the overall movement of total quality management. Seven Principles of the ISO 9000 standard are described in such sequence: Customer focus, Leadership,

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Engagement of people, Process approach, Improvement, Evidence-based decision making, Relationship management (ISO, 2015).

3.2.1 The benefits of the application of Customer focus

Focusing on customer needs is a key principle of quality management (Bergman and Klefsjö, 2010), therefore fulfilling customer requirements and striving to exceed customer expectations is the fundamental goal (ISO, 2015). Since patient experience is decisive in the improvement of the doctor-patient relationship, the management philosophy of the hospital is becoming 'patient-centered' (Ran et al., 2020). The success of Customer focus implementation depends on the capability of the organization to collect information about customer requirements and satisfaction, as well as on its capability to use these data for management decisions and continuous improvement (Béchet et al., 2015). Consequently, customer focus positively affects product and process innovation (Alshourah, 2021). Additionally, shared decision-making was proven to be a key element of patient-centeredness (Xanthos, 2021) and the involvement of patients in the continuous process of decision-making is underscored in various strategies (Geerts et al., 2021). Patient-centered healthcare is gaining international recognition when the patient takes greater responsibility for his or her own health and participates in decision-making regarding the diagnosis and treatment of the disease (Watson et al., 2018). The opportunity to create more value for the customer arises at every step of the interaction with the customer (ISO, 2015), consequently value creation proceeds throughout the process (Bergman and Klefsjö, 2010; Fundin et al., 2021). In addition, it is understood that customer focus is ensured by customers' perceived value to achieve target outcomes. Therefore customers are a fundamental element in managing the process of moving material as well as related information and financial flows (Islamgaleyev et al., 2020). Customer focus, from the perspective of employees, is reflected by putting the efforts into understanding and meeting customer needs (Celsi and Gilly, 2009) which, in addition, conduce to social performance (Jusoh et al., 2020). Moreover, through the concern for patients, a strong partnership relationship is being created, contributing to improved service processes (Sahputra et al., 2021). Patient-centeredness indicates that health care changes orientation to the patient as an individual focusing on respect and empowerment of him. It comprises of the individual participation of the patient and is based on a relationship of mutual trust, sensitivity, empathy, and shared knowledge (Geerts et al., 2021). It was found that empathy and communication self-efficacy have an impact on staff patient-centeredness (Jeon and Choi, 2021). The main advantages of customer focus application are: increased customer value, enhanced repeat business, increased organization's reputation, growth of revenue and market share (ISO, 2015). Forasmuch customer satisfaction is a driving force for organizational direction (Abukhader and Caglar, 2021) its enhancement is achievable through performing customer satisfaction surveys (Béchet et al., 2015), placing a suggestion box in the service room, as well as effectively resolving customer complaints (Abimbola et al., 2020; Alshourah, 2021; Maswadeh and Al Zu'mot, 2021; Sahputra et al., 2021). Therefore, employees should be committed to maintaining a high level of customer satisfaction (Kulenović et al., 2021). Additionally, customer focus is proven to be positively and significantly correlated with a gross profit margin, influencing financial performance (Han et al., 2021). The multifaceted nature of customer orientation involves elements that emphasize the importance of both

existing and potential customers of the company (Islamgaleyev et al., 2020) enabling to expand customer base (ISO, 2015), hence it is necessary to understand the current and future needs of these customers (Abukhader and Caglar, 2021; Islamgaleyev et al., 2020; Jusoh et al., 2020). Methods like focus groups and customer site visits could be applied for this purpose (Jusoh et al., 2020). Other opportunities to implement customer focus could be: identification and recognition of direct and indirect customers who receive value from the organization, correlation of the organization's goals with customer needs and expectations, declaration of customer needs and expectations throughout the organization, active customer relationship management in maintaining long-term success (ISO, 2015). Acknowledgment of the client's current and future needs and expectations as one of the facets of customer focus (ISO, 2015) is attainable by taking into consideration customer feedback (including customer complaints) within an organization, which is recognized as a valuable source of information. The information received is beneficial for decision-makers, though it is important that employees understand the purpose of customer focus and the way this information about customer requirements and satisfaction can be applied. One of the identified global suggestions for customer focus improvement is: establishing a corporate culture of customer focus and organizing appropriate training to develop the knowledge and skills of employees (Béchet et al., 2015). As a result, accomplishing and continually strengthening customer focus is vital for attaining and sustaining the competitive advantage of the organization (Madhani, 2020) and for reaching organizational goals (Maswadeh and Al Zu'mot, 2021). In conclusion, the extent of advantages of applying the principle of Customer focus depends on the ability of the organization to collect relevant information about customer satisfaction and requirements, though, more importantly, to employ these data for continuous improvement and decision making (Bucké et al., 2022).

3.2.2 *The benefits of the application of Leadership*

The role of leadership engagement and commitment through resource distribution is highlighted in plenty of empirical and nonempirical studies as an essential factor in the success of quality improvement programs (Hu et al., 2020; Kosinskienė and Ruževičius, 2011). Therefore, top management needs to be committed to making decisions with regard to improvement, as well as controlling their effects on improving the overall healthcare service quality (Abu Daqar and Constantinovits, 2020), and enhancing employee job satisfaction (Abukhader and Caglar, 2021). Leaders must develop their functional and adaptive ability to the constantly changing conditions and requirements of the health system, and consequently improve an organization's ability to become more responsive to future institutional and patient needs (Sahputra et al., 2021). The implementation and continuance of quality management, in the character of an integrated system, is based on leaders' adequate mindsets, i.e. perceptions and attitudes inasmuch as the leader uses inspiration to evoke feelings encouraging people to reach organizational goals (Els et al., 2021). Leadership/ management's commitment indicated to have a positive and significant association with process innovation (Alshourah, 2021; Antunes et al., 2021) as well as a product innovation (Alshourah, 2021). Defining organizational mission and vision, goals and objectives, and systematically expressing the short- and long-term paths are possible to implement through strategic planning (Sucuoğlu and Erdem, 2021), otherwise, a lack of planning and long-term policies, as well as non-clarity of objectives, hinder the

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achievement of organizational success (Kosinskiene and Ruzevicius, 2011; Mohamed, 2020). Quality, therefore, should be set by top management as a priority of strategic objectives at every organizational level (Maswadeh and Al Zu'mot, 2021). Moreover, leadership positively impacts strategic planning, customer satisfaction, assessment analysis, and information management, stressing personnel process management and efficiency. Leaders should serve as role models to ensure they foster a sense of belonging and organizational citizenship in a healthcare organization. As a result, leadership is emphasized to be a bridge that connects effectively strategic planning and strengthens the sense of direction of the goal achievement (Sahputra et al., 2021). In summary, a good deal of organizational success depends on leadership's commitment to quality and improvement (Bucke et al., 2022).

3.2.3 The benefits of the application of Engagement of people

The need to have competent, empowered, and involved people at all levels of the organization strengthens the organization's ability to create and deliver value (ISO, 2015), hence is perceived as a key factor in determining the success of an organization (Kokkina et al., 2018; Rich et al., 2010). Involving people at all levels in the continuous improvement of organizational processes (Nawelwa et al., 2015), as the decision-making process (Abu Daqar and Constantinovits, 2020), has a positive effect on organizational performance (Albrecht et al., 2015; Sundaray, 2011), effectiveness and efficiency of management of the organization (ISO, 2015), employee loyalty (Abukhader and Caglar, 2021) and commitment leading to competitive advantage (Abimbola et al., 2020). Therefore, organizations need to apply the bottom-up approach as it is the most useful strategy for most of the service-based sectors (Abu Daqar and Constantinovits, 2020). Recognition, empowerment, and strengthening of competence (Kokkina et al., 2020) lead to the engagement of people in achieving the organization's quality objectives (Abimbola et al., 2020; Abukhader and Caglar, 2021; ISO, 2015). It has a positive effect on employee job satisfaction as well (Kokkina et al., 2020; Monica and Krishnaveni, 2018; Moura et al., 2014) leading to higher quality results (Mosadeghrad and Afshari, 2021). On the contrary, lack of provider skills and competencies compromise technical quality of care. Improving providers' knowledge is realizable through mentorship, on-the-job training, and online approaches to build their confidence in providing healthcare (Mbugua et al., 2021). Improved quality of care, as regards history taking, information sharing, counseling/medical advice, and physical examination, is attainable through conducting regular training courses for health workers (Abukhader and Caglar, 2021; Tawfiq et al., 2020). Since human resource management have a positive and significant impact on corporate green management performance in the context of supply chain management of hospitals, companies can strengthen their employees' knowledge and abilities with regard to the effective use of resources, resulting in enhanced green performance. Higher motivation and a greater sense of empowerment of employees occurs working in an environment that ensures that their goods and services conform exceptional quality to society and protect the natural environment (Khalil and Muneenam, 2021). The investigated link between involvement/ empowerment of employees and process innovation was revealed to be a positive and significant (Alshourah, 2021; Antunes et al., 2021). Engagement of people is beneficial due to the effect of increased personal improvement, initiatives, and creativity (Abdul et al., 2019; ISO, 2015), strengthened trust, and collaboration throughout the organization (ISO, 2015), higher people's awareness of

the organization's quality goals, and greater motivation for reaching them through quality assurance training (Abimbola et al., 2020; Khan et al., 2020; Khdour et al., 2021). One of possible actions for achievement of engagement of people could be: communication with people to prompt understanding of the importance of their individual contribution (ISO, 2015; Khan et al., 2020) creating safe work environment which takes opinion of every staff member into account (Hedsköld et al., 2021) thus causing a sense of responsibility and involvement in quality management (Abimbola et al., 2020; Mosadeghrad and Afshari, 2021). Creating a fair incentive system and providing rewards for significant contributions (Almaamari et al., 2020), prioritizing quality as a basis and a reliable measure for estimating the performance of employees (Khdour et al., 2021; Kosinskienė and Ruževičius, 2011; Maswadeh and Al Zu'mot, 2021) encourages employee involvement in committing quality management practices (Almaamari et al., 2020). Ultimately, it should be noted that value creation and delivery are possible to achieve through the engagement of empowered and competent people in achieving the organization's quality objectives (Bucké et al., 2022).

3.2.4 The benefits of the application of Process approach

The quality management system is employed seeking to standardize and simultaneously improve existing work practices, through properly documented and standardized processes (Gremyr et al., 2021). Perception of results obtained through the execution of interrelated processes allows optimization of the organization's system and performance (ISO, 2015). Optimized performance through effective process management (ISO, 2015) can be attained through the application of a service process flow (Sahputra et al., 2021) or the development of job descriptions, complying with the requirements of processes (Maswadeh and Al Zu'mot, 2021). Process management as a positive parameter of performance management must be supported, verified, and periodically reviewed to ensure the perceived quality of care and high performance (Sahputra et al., 2021). Therefore processes must correspond to continual improvements (Abu Daqar and Constantinovits, 2020; Thao and Tu, 2021) in a way that progresses the work functions (Abu Daqar and Constantinovits, 2020). It is recommended to avoid complex processes composed of more bureaucratic practices in the work since they affect the quality of healthcare services negatively (Abu Daqar and Constantinovits, 2020). The findings have revealed that process management has a positive and significant influence on corporate green management performance in the context of supply chain management of hospitals (Khalil and Muneenam, 2021) as well as innovative activities (Alshourah, 2021). Additionally, the process approach allows the organization to grant confidence to interested parties with regard to its consistency, effectiveness, and efficiency (Arya, 2020; ISO, 2015). Possible actions for process approach principle's implementation consist of: determination of the goals of the system and processes required to achieve them, establishment of the authority, being conscious of the organization's opportunities and identification of resource constraints prior to action, establishment of process interdependencies and investigation of the impact of modifications to individual processes on the system as a whole (ISO, 2015), guarantee the necessary information is accessible for operating and improvement of the processes and for monitoring, analysis and evaluation of the performance of the overall system (Arya, 2020; ISO, 2015). Consequently, the application of the principle of the Process approach enables organizations both to standardize interrelated processes and reach effectiveness in optimization of performance and system (Bucké et al., 2022).

3.2.5 The benefits of the application of Improvement

The importance of continuous improvement is emphasized by successful organizations (ISO, 2015) since it has been proven to impact employee job satisfaction in a positive way, increasing their motivation to achieve high results of performance (Loyd et al., 2020; Mosadeghrad and Afshari, 2021). The implementation of the improvement principle brings such an advantage as improvement of process performance (Arya, 2020; Keenan and Rostami, 2021; Re and Aquere, 2021; Taggar and Ellis, 2007), enhanced attention to the progressive improvement, higher organizational competence, and customer satisfaction, enhanced focus on innovation, upgraded usage of learning for improvement (ISO, 2015). Continuous improvement is interlinked with process innovation (Antunes et al., 2021), inasmuch as innovation reinforces quality improvement by increasing the capability of responding to unexpected situations, allowing to succeed in the business targets for sustainability (Anttila and Jussila, 2021). The effect of continuous improvement of organizational processes is high-quality products and services (Martínez-Gómez et al., 2020). Continuous improvement is linked with not only improved results but, more importantly, improved capabilities, related to demand generation, supply generation, technology, operations, and people capability, all required to obtain better results (Mohamed, 2020). Healthcare organizations tend to use quality training or general seminars with regard to quality issues, which are basic quality improvement tools (Fok et al., 2021). Hence training involves continuous improvement (Els et al., 2021). Some of the advantageous ways to fulfill the principle of improvement could be: ensuring people's competence in successful contribution and completion of improvement projects, development, and deployment of processes for the accomplishment of improvement projects throughout the organization, observation and audit of planning, implementation, completion, and results of improvement projects, recognition, and acknowledgment of the improvement (ISO, 2015). To sum up, a sign of equality should be placed between the principle of improvement and all organizational components, since their synergistic effect determines the improvement of comprehensive results (Bucké et al., 2022).

3.2.6 The benefits of the application of Evidence-based decision making

Evidence-based decision-making enables managers not only to make informed decisions but immediately detect and avoid quality problems as well (Jusoh et al., 2020). Data-based hospital management contributes to continuous improvement of healthcare quality, better decision-making, and patient satisfaction with medical services (Ran et al., 2020). Doctors should consult with patients about the medicines they are prescribing, as this is useful for assessing side effects of previously used medicines, and interactions between multiple medicines, which may pose a risk to patient safety (Bubnienė and Ruževičius, 2010). Improved evaluation of process performance as one of the advantages of evidence-based decision-making (ISO, 2015) is attainable through managing patient experience data in order to improve the performance appraisal system (Ran et al., 2020). Other benefits of the implementation of evidence-based decision-making are the capability of achieving objectives, improvement of decision-making processes, and the ability to substantiate the effectiveness of previous decisions (ISO, 2015). Since hospital management mode

becomes standardized, refined, and scientific, massive patient experience data assist in the optimization of it (Ran et al., 2020). Possible actions for implementation of evidence-based decision making are: identification, measurement and monitoring of key organization's performance indicators, usage of adequate methods for analysis and evaluation of data and information, assurance of people's competence in data analysis and evaluation (ISO, 2015). In summary, the usage of evidence-based facts and data allows verification of effectiveness in decision-making (Bucké et al., 2022).

3.2.7 The benefits of the application of Relationship management

Long-term success demands managing an organization's relationships with all relevant interested parties (ISO, 2015). Cooperation and teams lead to better business-client relationships, higher organizational reputations, and better working environments (Fok et al., 2021; Keenan and Rostami, 2021). Moreover, a higher level of service quality can be achieved by opting for more managerial practices to enhance teamwork performance and efficiency (Abimbola et al., 2020; Abu Daqar and Constantinovits, 2020; Khmour et al., 2021; Maswadeh and Al Zu'mot, 2021). Opportunities for implementation of relationship management are identification of relevant interested parties (such as providers, partners, customers, investors, employees, or society as a whole) and their relation with the organization, prioritization of stakeholder relations which must be managed, measurement of performance and providing performance feedback to interested parties, as appropriate, promoting improvement initiatives, encouragement, and recognition of improvements by providers and partners (ISO, 2015). The traditional approach (care based on a patient referral to a healthcare facility) in quality management needs to be replaced by care based on collaboration and a long-term relationship between clinicians (managers, doctors, nurses, pharmacists) and patients (Bubnienė and Ruževičius, 2010; Kosinskienė and Ruževičius, 2010; Kosinskienė and Ruževičius, 2011). Participation of all stakeholders in decision-making and problem-solving within the organization should be encouraged (Almaamari et al., 2020; Arya, 2020) so that their objectives and values are addressed (ISO, 2015). Collaborative health care is reflected through healthcare professionals from different disciplines working together with patients and caregivers to provide comprehensive services to deliver high-quality personal health care (Watson et al., 2018). An environment focused on a team promotes proactivity and participative decision-making models (Fok et al., 2021; Keenan and Rostami, 2021), highlighting the importance of connectivity, interactivity, and shared knowledge and resources (Anttila and Jussila, 2021). An increased ability to create value for interested parties, as one of the positive aspects of relationship management (ISO, 2015), occurs, for example, during patient-provider interaction, building relationships with patients (Tawfiq et al., 2020) and through effective communication channels between the employees and customers (Abimbola et al., 2020; Maswadeh and Al Zu'mot, 2021). Healthy relationships among employees can be created through communication within different levels of the organization. In addition, satisfying the employees' needs through the cooperation of the executive managers and human resources department positively influences employee performance (Abukhader and Caglar, 2021). Conducting relationship management brings such benefits: increased ability to create value for interested parties by sharing resources and competence, and through quality risk management, assurance of a stable flow of services and products through the creation of a well-managed supply chain (ISO, 2015). To sum up, avoidance of potential risk occurrence and determination of stakeholders' objectives and values is possible in a

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long-term perspective through the participation of all stakeholders in the organization's problem-solving process (Buckè et al., 2022).

In conclusion, Total quality management from a management philosophy viewpoint can be applied targeting the consolidation of all organizational functions, since nowadays quality is considered not as a goal, but rather as a method of the entire organizational functioning. Quality management through the application of ISO 9000 certification is a promising initiative in achieving organizations' business success, leading to an inferior number of errors as well. Furthermore, in a holistic approach, a commonality of application of quality management principles brings a lot of benefits for organization, the main such as proactivity in decision making and problem-solving, contributing to the improvement of process performance and achievement of organizational goals.

4 An application of quality management principles for risk management maturity enhancement in healthcare

4.1 An application of Customer focus striving for a higher risk management maturity level

The higher patient involvement improves the quality and safety of care and hence is associated with positive health outcomes. In addition, the value of balancing staff and patient perspectives on safety culture is emphasized (Kuosmanen et al., 2021). Customer orientation should be the goal of healthcare organizations to ensure a correct perception of customers' needs, provision of quality service, and preventing any possibility of error (Ndubisi, 2012). Appropriate tools for providing the in-depth perception of patient safety threats could be learning from patient experience and feedback (O'Hara et al., 2018; Ward and Armitage, 2012), as well as customer satisfaction research and monitoring, and incorporating the necessary action (Alshourah, 2019; ISO, 2015). Customer focus implementation by prioritizing patient needs (Campbell et al., 2021) and active customer relationship management (ISO, 2015) would strengthen patient-doctor and patient-nurse relationships (Cheng et al., 2021), which would result in patient-centered care and improved decision-making processes (Kuosmanen *et al.*, 2021). In summary, achievement of a higher level of risk management maturity in healthcare depends on the application of the principle of Customer focus through higher patient involvement, learning from patient feedback, monitoring of patient satisfaction, active patient relationship management.

4.2 An application of Leadership striving for a higher risk management maturity level

Leaders at all levels encourage the involvement of people in the achievement of the organization's quality goals (ISO, 2015) by aligning a vision and mission, which highlight a high-risk healthcare environment (Sammer et al., 2010). Better conditions for risk avoidance can be created by ensuring that patient safety goals and objectives are elements of the organization's strategic and operational plans (Lawati et al., 2018). Better consolidation of the organization's processes as an effect of leadership application (ISO, 2015) can be supported by hospital managers and unit supervisors emphasizing the importance of patient safety (Hedsköld et al., 2021; Kim and Moon, 2021), encouraging

reporting of errors (Guchait et al., 2020) through open communication and nonpunitive attitude to errors (Bailey and Dungarwalla, 2021; Chegini et al., 2020; Hedsköld et al., 2021; Lee et al., 2019; MacPhee et al., 2017; Rigobello et al., 2017; Sendlhofer et al., 2015; Stoyanova et al., 2021). Moreover, leaders providing feedback about reactions to errors contribute to continuous organizational learning, striving for enhanced patient safety (Hedsköld et al., 2021; Krishnasamy et al., 2021; Lee et al., 2019; Liukka et al., 2021; Stoyanova et al., 2021). Strong leadership is emphasized as a key factor in managing unethical behaviors and mitigating safety issues (Campbell et al., 2021; Keenan and Rostami, 2021). Development of effective leadership contributes to improved communication at the level of different organizational functions (ISO, 2015) since the failure of communication is related to leaders' inability of building effective communication channels contributing to patient safety (Connerley and Pedersen, 2005) and avoiding errors (Albalawi et al., 2020). Accordingly, establishing an open communication system in healthcare institutions is an important factor in enhancing patient safety outcomes (Verbakel et al., 2014), while a dysfunctional communication culture can endanger patient safety (Kuosmanen et al., 2021; Stoyanova et al., 2021). Possible actions for achievement of effective leadership could be: providing the necessary resources and support that will enable front-line staff of proceeding with the processes that support patient safety (Bailey and Dungarwalla, 2021; Hedsköld et al., 2021; ISO, 2018; Kuosmanen et al., 2021; Lee and Dahinten, 2020), training and empowerment to ensure people's accountability, inspiring, encouraging people and recognizing their contribution (ISO, 2015). Effective leadership is possible to achieve by familiarization with the organization's mission, vision, policies, strategy, and processes at the level of the entire organization (ISO, 2015), whereas rigid policies in healthcare institutions can result in hesitation of staff to report about the occurrence of an error, concealment of the problem, failure of recording the issue. This would consequently create an endless cycle of medical errors (Robertson and Long, 2018). Violations of policies and procedures and poor reporting of events tend to appear due to poor communication which relates to unsafe employee behaviors (Vermeir et al., 2015). To sum up, since a leader's value scale can determine the organization's approach to safety and the importance of risk management (Buckè et al., 2022), a higher level of risk management maturity is attainable through aligning a vision and mission regarding risks, emphasizing the importance of patient safety, encouraging reporting of errors, open communication and nonpunitive attitude of leaders to errors.

4.3 An application of Engagement of people striving for a higher risk management maturity level

Increasing staff's belief that their personal well-being at work cares for hospital managers leads to enhanced employee commitment to prevent and mitigate safety risks, which could be the cause of medical errors (Mauno et al., 2007; Wollard and Shuck, 2011). Engagement of people causes increased involvement of people in improvement activities (ISO, 2015), creates the conditions for recognition of undesirable events occurrence, learning from them, and working towards the prevention of them, as a result leading to improved patient safety (Oyebode, 2013). The opportunity to learn is lost when errors, problems and failures are not published, analyzed, and solved (Guchait et al., 2020). In most cases, greater responsibility for events with less dependence on the manager entails greater freedom to report adverse events and errors (Stoyanova et al., 2021). Although everyone is responsible

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for managing risks, assigning responsibility and accountability at appropriate levels ensures risk management integration into organizational activities (ISO, 2018; Rana et al., 2019). A lack of staff engagement creates a barrier to the success of risk management (Araújo and Gomes, 2021). Moreover, encouragement of cooperation throughout the organization is highlighted (ISO, 2015) since effective communication is an integral part of patient safety (Leonard et al., 2004), while communication issues are part of the common root causes of undesirable medical errors (Rodziewicz et al., 2021). Lack of teamwork among healthcare professionals is frequently believed to independently trigger systems failures (Krishnasamy et al., 2021). The important contribution of teamwork to patient safety within community practice is highlighted since it points out that staff treat each other with respect, work together as an effective team, and become aware of their respective roles and responsibilities (Campbell et al., 2021; Owusu et al., 2021). Continuous staff engagement in safety programs can be ensured through a reward system for reporting unusual errors (Cropper et al., 2018), as possible reward mechanisms based on various motivational measures (Kokkina et al., 2020). Development and implementation of individual and group error management strategies can be under consideration as one of the criteria for employee performance assessment (Guchait et al., 2016). Empowerment of people to identify inconsistencies and take initiative without fear (ISO, 2015) can be reinforced by intense training for all healthcare staff members about error prevention techniques (Guchait et al., 2016), and by the application of safety policies, as a vital part of safety program implementation (Cropper et al., 2018; Kim and Moon, 2021). Therefore, training is a success factor in risk management (Araújo and Gomes, 2021), since it helps to manage most of the risks that occur due to quality service failures (Khan et al., 2020). Moreover, management should focus efforts on increasing empowerment as empowerment is one of the factors that influence patient safety activities. Additionally, the empowerment of nurses has an effect on their attitudes and behaviors, which conditions better decision-making in the clinical field and improves the overall quality of healthcare provided to patients (Kim and Yu, 2021). The enhancement of the communication, theoretical and practical training courses are useful methods for control of clinical risks and improvement of patient safety (Serban et al., 2020). To summarize, engagement of employees in the risk management process, a reward system for reporting errors, appointing responsibility and accountability for managing risks, training about error prevention techniques, empowering employees to take initiative (Buckè et al., 2022), increased involvement of people in improvement activities can lead to a higher level of risk management maturity.

4.4 An application of Process approach striving for a higher risk management maturity level

Inasmuch as medical errors primarily occur due to system and process issues, rather than individual human fault (Im and Aaronson, 2020; Mohamed, 2020), managing and perceiving all activities as interactions of interconnected processes, functioning as a well-organized system, would lead to more effective and efficient achievement of consistent results (ISO, 2015). The need for formation of well-developed 'system approach' strategies arises (Kar et al., 2013; Keenan and Rostami, 2021), such as a standard risk management process (Perrenoud et al., 2021), because errors are influenced by system, process, and circumstances that cause people to make mistakes or fail to prevent them (Kar et al., 2013;

Keenan and Rostami, 2021). The proactive use of risk management is important, focusing on system or process errors (Foda et al., 2020) and implementing continuous monitoring as a control method (Kim and Moon, 2021). Therefore, changing the process can prevent from root causes of errors resulting from faulty systems (Mohamed, 2020). Accordingly, the absence of process mapping may compromise the identification of the risks emerging from non-compliance (Araújo and Gomes, 2021). A standardized risk management process enables organizations to manage risk with the understanding that all risks correspondingly are identified, analyzed, and mitigated (Perrenoud et al., 2021). The creation of patient safety management procedures or systems striving to reduce the number of patient safety incidents should be the focus of attention in medical institutions (Kwan et al., 2021). One of the possibilities to overcome this challenge is the establishment of an electronic health record mechanism for detecting and monitoring the adverse events (Kakemam et al., 2021). Consistent and predictable outcomes through a system of related processes, as one of the advantages of the process approach (ISO, 2015), is difficult to achieve due to the complexity of uncovering constant causes of errors and seeking solutions for a reduction of the probability of its recurrence (Oyebode, 2013). However, relying on standardized rules and orders could indeed cause problems, as staff may simply depend on these ready-to-use schemes instead of becoming involved in strategic planning (Göktürk et al., 2017). Efficient usage of resources and diminishment of cross-functional barriers as one of the process approach advantages (ISO, 2015) can be achieved by managers focusing on acknowledging staff capabilities and planning their appropriate competencies, creating preconditions for the staff's capability to reorganize and responding to a variety of expected and unexpected situations, as well as notice risks (Hedsköld et al., 2021). In order to achieve this goal, it is important that managers have up-to-date knowledge of the healthcare staff working environment, whereas scarcity of managers' knowledge and skills threaten patient safety. Assurance of staff competency regarding patient safety depends on the manager's responsibility for identifying deficiencies and then correcting them through staff training and education (Kuosmanen et al., 2021). On the contrary, hierarchical structures restrict dialogue and discussion with respect to finding solutions to emerging problems (Göktürk et al., 2017). Whereas, the establishment of responsibility and accountability for managing processes is one of the process approach implementation stages (ISO, 2015), all members of the healthcare team play a significant role in ensuring the provision of healthcare is safer for patients and healthcare providers (Helo and Moulton, 2017). Additionally, hospital administrators and managers have to encourage staff to report errors and near misses so that organizations can engage in problem-solving, prevent future patient harm, and promote patient safety (Lee and Dahinten, 2020). The adoption of a systematic approach in risk management, enabled by systems and processes, increases the likelihood of correct decisions being taken regarding risks (Araújo and Gomes, 2021). In conclusion, the creation and implementation of a standardized risk management process, reflecting a 'system approach' with reference to risks, hence proactivity in risk management (Bucké et al., 2022), acknowledging staff capabilities, and planning their appropriate competencies, the establishment of responsibility and accountability for managing processes can contribute to the achievement of a higher level of risk management maturity.

4.5 An application of Improvement striving for a higher risk management maturity level

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Continuous improvement is one of the eight basic principles of effective risk management (ISO, 2018), thus it is closely related to risk management maturity (Hoseini et al., 2019). Improvement is a precondition for maintaining the current level of performance in response to changes in internal and external circumstances, leading to new opportunities (ISO, 2015). In addition, improvement strategies can be accomplished through the identification of errors (Rodziewicz et al., 2021). Continuous improvement determines increased motivation of individuals for learning from previous mistakes (O'Hara et al., 2018; Sammer et al., 2010; Ward and Armitage, 2012). It hence causes an intensified focus on root cause analysis and determination, followed by preventive and corrective actions, and improved capability to predict and react to external and internal risks, and opportunities (Saleh et al., 2018). Accordingly, participating in improvement teams that analyze the risks of each clinical area and make suggestions for preventive actions is another possible action for improvement (Ulibarrena et al., 2021). Furthermore, there is a need for continuous incorporation and improvement of risk management processes in organizations (Araújo and Gomes, 2021). Ways to implement the principle of improvement could be: encouragement of improvement objectives' determination at all levels of the organization (ISO, 2015), educating and training people at all levels on how to make use of main tools and methodologies, for instance, error prevention techniques, for the achievement of improvement objectives (Cropper et al., 2018). Hospitals could and should make use of accreditation as a foundation to attain organization-wide improvement in practice and patient outcomes (Titi et al., 2021). In summarizing, a higher level of risk management maturity can be achieved through the application of continuous improvement, stressing the importance of learning from errors (Buckè et al., 2022), root cause analysis, and determination of risks, and improving the capability to predict and react to all kinds of risks.

4.6 An application of Evidence-based decision making striving for a higher risk management maturity level

It is important that all healthcare decisions and practices are based on the healthcare company's consideration of the evidence, clinical experience, patient values, and preferences (Gallagher-Ford and Connor, 2020) inasmuch as it often involves a variety of types and sources of inputs, as well as the perception of them, which can be subjective (ISO, 2015). Consequently, achieving the desired results is more likely through decision-making based on data analysis and evaluation (Manatos et al., 2017), since decision-making is often a sophisticated process, always involving a certain degree of uncertainty (ISO, 2015). Preventive measures for the management of adverse events should be foreseen in the handling of patient complaints, non-compliances, medical audit reports on errors, and adverse events (Bubnienė and Ruževičius, 2010). Patient safety is influenced by the clinical decision-making of nurses and depends on their ability to correctly identify and evaluate risks regarding patients (Trevino et al., 2018). Therefore, it is relevant to be aware of the cause and effect relationship and probable unexpected consequences (ISO, 2015). To sum up, correct decisions made for risk management based on evidence, clinical experience, patient preferences, and values can help achieve desired results in healthcare and patient safety (Buckè et al., 2022), being a reflection of a higher level of risk management maturity.

4.7 An application of Relationship management striving for a higher risk management maturity level

Encouraging and enhancing patient and family involvement and participation in healthcare safety and patient safety initiatives is a key aspect of the management of improvement strategies and prevention of errors (Vaismoradi et al., 2015). Accordingly, the performance of an organization is affected by relevant interested parties (ISO, 2015). Correct communication awards the patient both a sensation of safety and satisfaction and also gives assistance to reduce the risk of adverse events: an accurate collection of medical history, chronic medication, risk of allergies, consideration of the patient's overall health problems, and making the optimal therapeutic decisions (Serban et al., 2020). The commitment to reporting incidents among healthcare professionals is proven to be crucial and positively influenced by the improvement of patient safety culture (Camargo et al., 2012). The importance of sharing information, resources, knowledge, and experiences (Jung and Yoon, 2017) with relevant stakeholders thus is highlighted in the International standard (ISO, 2015). In addition, analogous errors can be prevented in the future through the usage of knowledge management and knowledge sharing about errors, enabling organizations, managers, and employees to properly anticipate such errors and take proactive measures (Guchait et al., 2015). Engaging patients and families in their care plan to achieve high-quality, safe, and effective care may serve as preventive action against the development of unexpected dangers (ALFadhalah et al., 2021). More actions intended for greater participation of the patient and those around them to foster the integration of safety could be 'focal groups', working groups involving patients' associations, etc. (Ulibarrena et al., 2021). In summary, the involvement and participation of all interested parties in patient safety initiatives and knowledge sharing about errors can ensure a higher level of risk management maturity.

In summarizing, a higher level of risk management maturity is attainable through the synergistic application of all seven quality management principles, since holistically they bring more evident benefits than those applied severally. Enhanced risk management maturity in healthcare is reflected through the achievement of patient safety goals and objectives, prevention and mitigation of safety risks, enhancement of patient safety outcomes, better conditions for risk avoidance, identification of inconsistencies, recognition of undesirable events occurrence, awareness of cause and effect relationship and probable unexpected consequences. In addition, better reporting of errors, intensified focus on root cause analysis and determination, followed by preventive and corrective actions, and the improved capability of predicting and reacting to internal and external risks and opportunities are other effects of a higher level of risk management maturity. The aforementioned components of the risk management process can be successfully implemented through the application of ISO 9000 standard emphasized principles: Customer focus, Leadership, Engagement of People, Process Approach, Improvement, Evidence-based decision making, Relationship management. The main peculiarities of their application manifest through strengthening patient-doctor relationships with higher patient involvement, open communication and a nonpunitive attitude to errors, assigning responsibility and accountability at appropriate levels ensuring risk management integration into organizational activities, teamwork, and training, standardization of risk

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management process, evidence-based decision making and relationship management with relevant interested parties.

5 Conclusions

5.1 Theoretical contributions

This paper proposes new contributions to the theory and scientific sources by describing a theoretical link between the application of quality management principles and risk management maturity, as well as the benefits of the application of quality management principles. There is a lack of scientific research, examining the factors influencing risk management maturity. The findings of this study specify a close linkage between the concept of Quality Management Principles and the Risk Management Maturity paradigm.

5.2 Implications for practices

The findings are significant in a practical sense regarding their benefits not only for certified organizations that implement quality management systems but for all types of organizations that seek to successfully implement risk management processes. This paper accentuates the need to apply quality management principles and implement risk management maturity models. Since managing risks is a fundamental part of all activities related to an organization, risk management should involve all processes of the organization, enabling an organization to respond appropriately to change. Moreover, a fully performed risk management function through the adoption of a systematic approach can turn a value-adding resource. Decision-making is influenced by external and internal factors, which managed as risks, can bring both unavoidable threats and opportunities.

Risk management maturity can be defined as the level at which an organization has implemented relevant risk management practices. Therefore, the higher the level of implementation of risk management practices, the higher the maturity level of risk management. Moreover, risk management maturity assessment can be perceived as SWOT analysis, or situational analysis, since it allows to determine potential strengths, weaknesses, opportunities, and threats.

Total quality management from a management philosophy viewpoint can be applied targeting the consolidation of all organizational functions, since nowadays quality is considered not as a goal, but rather as a method of the entire organizational functioning. Quality management through the application of ISO 9000 certification is a promising initiative in achieving organizations' business success, leading to an inferior number of errors as well. Furthermore, in a holistic approach, a commonality of application of quality management principles brings a lot of benefits for organization, the main such as proactivity in decision making and problem-solving, contributing to the improvement of process performance and achievement of organizational goals.

In summary, organization can attain a higher level of risk management maturity through the synergistic application of all seven quality management principles, since holistically they bring more evident benefits than those applied severally. Enhanced risk management maturity in healthcare is reflected through the achievement of patient safety goals and objectives, prevention and mitigation of safety risks, enhancement of patient

safety outcomes, better conditions for risk avoidance, identification of inconsistencies, recognition of undesirable events occurrence, awareness of cause and effect relationship and probable unexpected consequences. In addition, better reporting of errors, intensified focus on root cause analysis and determination, followed by preventive and corrective actions, and the improved capability of predicting and reacting to internal and external risks and opportunities are other effects of a higher level of risk management maturity. The aforementioned components of the risk management process can be successfully implemented through the application of ISO 9000 standard emphasized principles: Customer focus, Leadership, Engagement of People, Process Approach, Improvement, Evidence-based decision making, Relationship management. The main peculiarities of their application manifest through strengthening patient-doctor relationships with higher patient involvement, open communication and a nonpunitive attitude to errors, assigning responsibility and accountability at appropriate levels ensuring risk management integration into organizational activities, teamwork, and training, standardization of risk management process, evidence-based decision making and relationship management with relevant interested parties.

5.3 Limitations and future extensions

The limitations of this article are in regard to the generalization of the findings of this study. Primarily, preconditions for some potential biases can occur while assessing the quality of included studies since a systematic review of scientific sources has not been accomplished. The second limitation of this study is the restriction of the search for scientific sources in a particular business sector, namely healthcare with reference to the generalization of the findings. Thirdly, the study likely holds a degree of subjectivity due to the conclusions of the article being formulated on the basis of researchers' insights, grounded by the scientific literature. Finally, the theoretical link between the application of Quality Management Principles and Risk Management Maturity has not been substantiated by an authorial quantitative research. The analysis of the latest scientific sources on the conceptual topic studied in this paper has revealed relevant insights for future research. The authors' future research can focus on the empirical assessment with regard to the application of quality management principles that have the strongest impact on the maturity of risk management in healthcare. Additionally, empirical estimation of the mediating effect of Error Management Culture on the relationship between the application of Quality Management Principles and Risk Management Maturity would be useful as well.

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